AVIATION

The Oldest American Aeronautical Magazine

FEBRUARY 9, 1925 Issued Weekly PRICE 10 CENTS

When the sun looked like the moon—The growing eclipse photographed from U.S.S. Los Angeles

VOLUME XVIII

NUMBER 6

SPECIAL FEATURES

HOW THE MODERN SEAPLANE WAS BORN

SUCCESSFUL TESTS OF LOENING AMPHIBIAN

THE INTERNATIONAL AERONAUTIC FEDERATION

NEW AIR LINERS AT THE PARIS AERONAUTIC SALON

GARDNER PUBLISHING CO., INC.
HIGHLAND, N. Y.
225 FOURTH AVENUE, NEW YORK

Entered as Second-Class Matter, Nov. 22, 1920, at the Post Office at Highland, N. Y. under Act of March 3, 1879.

THROUGH the entire history of aviation over a period of 20 years the Wright organization has maintained its high position.

Its leadership has been soundly built upon extensive research and intelligent engineering development, although its experience includes the manufacture of aeronautical equipment in extremely large quantities.

The Wright organization, ever mindful of its first achievement—the art of flying—continues to contribute each year its best ability and engineering experience to the advancement of flying.

WRIGHT AERONAUTICAL CORPORATION
PATERSON, N. J., U.S.A.

WRIGHT AIRCRAFT

"The Identification of Incomparable Service"

Navy ships equipped with Wright Air Cooled Engines flying in formation over San Diego, California

FEBRUARY 9, 1925

AVIATION

VOL. XVIII. NO. 6

Published every Monday

CONTENTS

Editorials	153	Regulation Benefits Canadian Aviation	161
How the Modern Seaplane Was Born	154	New Valve for Gasoline Engines	161
Successful Tests of Loening Amphibian	155	Future of Zeppelin Plant	161
The International Aeronautic Federation	156	Once More the Parachute	161
Ascending the Throne via Airplane	157	25 Years of Zeppelin Construction	162
Air Liners at the Paris Aero Salon	158	National Air Policy Suggestions	162
Scintilla Magneto Adopted by Navy	159	Light Planes and Gliders	163
Air Service Awards	160	Airports and Airways	164
Naval Aviation Awards	160	United States Air Forces	166
General Brancker Reaches India	160		

GARDNER PUBLISHING COMPANY, Inc., *Publishers*

GENERAL AND EDITORIAL ROOMS: 225 FOURTH AVENUE, NEW YORK

Publication office

HIGHLAND, N. Y.

Subscription price: Four dollars per year. Single copies ten cents. Canada, five dollars. Foreign, six dollars a year. *Copyright 1925, by the Gardner Publishing Company.*

Issued every Monday. Forms close ten days previously Entered as second-class matter Nov. 22, 1920, at the Post Office at Highland, N. Y., under act of March 3, 1879.

The National Steel Products Company

DAYTON, OHIO

CONTRACTORS TO THE U. S. GOVERNMENT

We are Manufacturers and Headquarters for Aircraft Parts

Sylphon Type Fuel Pumps
Gear Type Fuel Pumps
Oil and Water Pumps
Gasoline Level Gauges
Gasoline Cork Seated Valves
Gasoline Strainers
Gasoline Filler Units
Gasoline Line Fittings
Fuel Relief Valves
Fuel Overflow Indicators
Fuel Pump Drive Assemblies
Intake Headers
Liberty High Compression Pistons
Standard Engine Controls
Manifold Service Sets
Improved Liberty Camshaft Drive Gears
Spare Wheel Carrier Assemblies
Liberty Engine Tool Kits

We specialize in the manufacture of Aircraft fittings, and are in a position to furnish Castings and Drop Forgings for all parts.

We have all the facilities of a completely equipped, modern tool and machine shop, and are in a position to quote you on your requirements.
All correspondence and inquiries will be given prompt and careful attention.

THE NATIONAL STEEL PRODUCTS CO.,

P. O. BOX 865, DAYTON, OHIO

Curtiss Reed Duralumin Propeller used on U. S. Pursuit Planes

FAIRCHILD FLYING CORPORATION

DIVISION OF FAIRCHILD AERIAL CAMERA CORP.

EAGLE ADDRESS "FAIRCAM"
NEW YORK CITY 130 WEST 42ND STREET

January 8, 1925.

Curtiss Airplane & Motor Co., Inc.,
Metal Propeller Department,
Garden City,
L.I., N.Y.

Attention: Mr. C. B. Jones.

Gentlemen:-

As one of the civilian aviation companies using the Curtiss-Reed Metal Propeller, we felt that you might be interested to have a report on how this propeller is working out for us.

Last September we purchased from you for our Canadian Company - Fairchild Aerial Surveys Company (of Canada) Ltd. - one of these propellers for use on our Huff Daland machines. The requirements for a propeller in this work are rather severe inasmuch as this machine is operated as a seaplane all summer, subjecting the propeller to the usual spray conditions encountered with seaplanes, and as a land plane flying with wheels or skiis in the winter time. During much of the summer season the machine is away from its base and, therefore, moored out in the open without protection. Furthermore, in Quebec the temperature differences between winter and summer are very severe.

It was only after very careful flight tests made by the writer personally that the order was placed with you for this Curtiss-Reed Propeller, and we are very pleased indeed to inform you that the results obtained with it have exceeded the guaranteed performance. A great improvement has been effected in the climb of the machine when carrying the heavy loads which are used in Canada, and whereas the wooden propeller formerly used caused excessive vibration in the machine, the Curtiss-Reed Metal Propeller has been found to be remarkably smooth. The results have been so good that our Canadian Pilot, Mr. Kenneth F. Saunders, describes them as wonderful.

After over three months' trial, we are thoroughly convinced that the Curtiss-Reed Duralumin Propeller is the best obtainable on account of its qualities of considerably increased performance, safety, durability, and freedom from deterioration due to climatic and other conditions.

We are so well pleased with the results obtained that we are placing with you an order for one more of these propellers to be used on our Huff Daland machine which we are flying here.

Yours very truly,

Richard H. Depew Jr

Richard H. Depew, Jr.,
Vice President.

The Curtiss-Reed Duralumin Propeller will give YOU similar results

Our new prices will interest you

CURTISS AEROPLANE & MOTOR COMPANY, Inc.

Metal Propeller Department

Garden City, N. Y.

FACTS ABOUT WRIGHT ENGINES

The eight bulletins illustrated describe the outstanding features of the entire assemblage of Wright Aeronautical Engines and the two Wright Marine Engines whose performance has become famous since they were placed on the marine market. Both marine and aeronautical bulletins contain power curves, weights, installation drawings, specifications, definite performance guarantees and facts that indisputably point to leadership in the engines' particular power range.

The air cooling advantages described in J-4 and L-4 bulletins are of especial interest. In all these bulletins the detailed accurate information given on the design and building of engines since the war will prove of unusual value. So thoroughly are these presented in each bulletin that it is suggested you write for all.

Fair Prices
Prompt Deliveries
Definite Guarantees
Warranted against Defects

WRIGHT AERONAUTICAL CORPORATION
PATERSON, N. J., U. S. A.

WRIGHT ENGINES

L. D. GARDNER
PRESIDENT
EARL D. OSBORN
VICE PRESIDENT
L. D. WEBSTER
TREASURER
GEORGE NEWBOLD
BUSINESS MANAGER

AVIATION

LADISLAS D'ORCY
EDITOR
VIRGINIUS E. CLARK
EDWARD P. WARNER
RALPH H. UPSON
EDMUND T. ALLEN
CONTRIBUTING EDITORS

VOL. XVIII FEBRUARY 9, 1925 No. 6

Pay Load versus Speed.

THE amount of pay load which an airplane can carry varies in direct proportion with the cruising speed of the plane. Exact comparisons could be made theoretically, but the principle is well illustrated by a comparison of existing machines. For example, the transcontinental non-stop Fokker T2 could carry a practical pay load of over 2000 lb. with a Liberty motor and cruise at a speed of about 80 mi./hr. The Air Mail planes carry only 600 lb. of pay load on a Liberty motor, but cruise around 100 mi./hr. There is no high speed plane built around the Liberty engine, but judging by the experience with various pursuit ships a cruising speed of 140 mi./hr. could be obtained if the pay load were reduced. There has been a tendency to compromise and standardize commercial ships to a cruising speed of about 100 mi./hr. No speed much over this has been tried commercially and any speed much under this figure is considered by most people as impractical. In all other transportation fields, however, there is the widest range of speeds which depend on the nature of the goods to be carried and the conditions of the traffic.

Air traffic is based on the same principles as any other form of transportation: the slower the speed the cheaper the transportation, so that the air really offers a field for slow and for fast machines. This does not seem to be fully understood, however, by many of those who are thinking about the problems of aerial transportation. Although the commercial airplane with a cruising speed of about 100 mi./hr. will probably remain for some time the most useful all-round ship for general transport, it seems that there is also a field for planes carrying a very small pay load but cruising at 150 mi./hr., as well as for planes which cruise at only 65 mi./hr. but carry a very large pay load. For instance there are many undeveloped districts and countries where ground travel is infrequent, irregular, and at best very slow. A plane cruising at 65 mi./hr. would be many times faster than land travel, even if delayed by head winds. However, as in these districts there is a very small volume of business, it will be necessary for the plane to get a large portion of it. The timesaving feature of the plane will help, but cost of air travel is equally important if a large proportion of the traffic is to be secured. And as the cost of flying grows in direct proportion to the speed, a slow speed plane would be essential for this kind of work.

On the other hand, where a large volume of traffic and well developed systems of transportation are available, high speed is absolutely essential, for though the plane need only get a very small percentage of the total traffic, the small volume of clientele or of valuable freight will be willing to pay an extremely high price for speed. Last year a Curtis Pursuit plane flew from New York to San Francisco between dawn and dusk. It is not impossible that within five years a special coast to coast air transport service could be run over night, provided that the commercial load was small. A pay load of 200 lb. sounds very small, but it would mean over 12,000 letters written on thin paper, which would take care of all the telegrams between New York and San Francisco, of the bank clearance (where the checks were for large amounts), and of most of the really important letters besides. This special traffic would be willing to pay the price.

There is a vast field for study here which has received very scant attention. It is hoped that more people wil realize the importance of the commercial plane which is specialized for a given use and not condemn it because it does not have a cruising speed of 100 mi./hr.

Revolving Wings and Revolving Cylinders

COMPARATIVELY speaking, the airplane has been in existence so long, and its fundamental elements have apparently reached such a standardized form that most aeronautical engineers have come to consider it as the only practicable heavier-than-air machine. So far the results achieved with helicopters, while interesting enough from an academic point of view, have not been such as to warrant the belief that the direct lift machine is likely to challenge the present position of the airplane. The flapping wing machine, or ornithopter, which still had a few serious advocates not so long ago, has now practically been relegated into the limbo of immature inventions.

As the majority of text books on aeronautics always refer to the airplane, the helicopter and the ornithopter as *the* three types of heavier-than-air craft, the inference may easily be drawn by the student that this is the end and all of heavier-than-air possibilities and that nothing is served by searching beyond to achieve mechanical flight by means of dynamic reaction.

Fortunately, forward looking engineers and scientists are not wanting. Witness the "Autogyro", a revolving wing machine invented by the Spanish engineer La Cierva, with which some promising flights have been accomplished during the past year. This strange looking craft flies much like an airplane, but its take-off and landing are more like those of a helicopter, the flight trajectory being then nearly vertical. The whole idea of this machine is still in its infancy, but it may contain the germ of a great and fundamental improvement, and solve perhaps that difficult combination of the airplane with the helicopter which many forsee as an unescapable necessity for large air liners.

The application of the Flettner Rotor principle to airplanes is another subject which seems quite promising, even though it is not necessary to assume rightaway that we shall discard wings in the future and fly with rotating cylinders. The mere fact that the "rotor plane" would make stalling impossible would in itself justify all the experiments that are being conducted with combinations of rotors and airfoils.

How the Modern Seaplane was Born

By COMD'R. J. C. HUNSAKER, (C.C.), U.S.N.

Abstract of paper read before the Institution of Aeronautical Engineers, London, England.

The development of seaplanes has followed very closely and continuously the development of the airplane and its engine. While there was an apparent lag of some three years between the Wright airplane of 1908 and the first Curtiss seaplane of 1911, the intervening period was devoted to persistent experimenting. I am not familiar with European experiments during this period, but our first attempt at a seaplane was made with the "June Bug," built by Glenn Curtiss with the late Mr. and Mrs. Alexander Graham Bell (Aerial Experiment Association). In 1909 Curtiss fitted the "June Bug" with twin floats of boat-like shape. The machine did not leave the water although the float system looks somewhat orthodox even today. The floats would not plane, and, furthermore, there was no margin of power.

Early Types of Seaplane

Realizing that the power was inadequate, Curtiss, with a resourcefulness that marks the inventor, abandoned his twin floats in favor of an Indian canoe as a single float to get the minimum resistance to propulsion. The Indian canoe has graceful and easy lines and is easy to drive at moderate speeds. Curtiss's 1909 Gordon Bennett Cup winner had ample power, and, with the canoe added as a float, he succeeded in leaving the water in 1910, but crashed badly in landing. The light canoe construction was obviously unsuitable to withstand the shock of landing at high speed. This partial success pointed the way, and to avoid loss of time during the winter months, Curtiss established a camp at San Diego, in California, where certain naval officers joined him to receive instruction in flying and to assist in the development of a practical naval seaplane. From this association there was born the modern seaplane, and also that collaboration between Curtiss and the Navy which has had such happy results in the fourteen years that have passed since that time.

The experiments of the winter of 1910-11 were most fruitful. On Jan. 28, 1911, Curtiss flew from and alighted on the water, using floats of wing section. On Feb. 17 he alighted alongside U.S.S. Pennsylvania, and was hoisted aboard; was then hoisted out and got under way and flew back to his camp on North Island. For this experiment he had a flat-bottomed, box-type float which proved relatively very successful.

We must remember that these early experiments were tentative, and many suggestions were tried which, with our present knowledge we should consider *a priori* as unsound. But we are engineers and not inventors, and perhaps somewhat too conservative in feeling. However, it seemed clear, then, that a seaplane float should not be boat-shaped, but box-shaped, with a flat planing bottom. In order to have aerodynamic control at starting the rear edge of the box float could not be too far aft. The rear edge, cut off square, acted as a step. The early box floats suffered, therefore, from deficient flotation aft, and the tail was prone to drop into the water. They also were inclined to porpoise when planing, due to the flat bottom, and it was soon found important to delay planing until aerodynamic control was obtained from speed.

The Curtiss "Triad"

Not distressed by these obvious defects in the first seaplane, Curtiss proceeded to make his seaplane amphibious. In July, 1911, the "Triad" was demonstrated both on water and on land. It is of interest to note, at this time, the landing of a Curtiss land-type airplane on an extemporized flying deck with sand-bag arresting gear, on the U.S.S. Pennsylvania (November, 1911).

The defects of the flotation system were nevertheless realized, in spite of the success of this first machine, and during the summer of 1912 Curtiss fitted a seaplane with a long float, making our first flying boat. To permit planing, the flat bottom of the boat had a knuckle amidship, which was replaced by a step, substantially as we know it today.

The development up to this time had been largely concerned with the central-float type, and involved provision of lateral stability by means of wing floats. These were at first simple cylinders under the wing tips fitted with paddles to force them to leave the water as speed was acquired.

For smooth water such floats were effective enough, but in rough water the wing floats were apt to be torn loose. Also the flat-bottomed, main float was far from satisfactory in rough water.

The Engineering Phase

The engineering phase of our seaplane development I consider to have commenced with Naval Constructor H. C. Richardson's work in 1912. He ran a comprehensive series of tests in the Experimental Model Basin, Washington, on models of seaplane floats, and showed clearly the effect of the form of the float on its water performance. The tank brought out the advantages of Vee-bottom, long easy form with a single step and correct rise of after body. The best tank models were tried full-scale and proved that at corresponding speeds the tank tests gave a correct indication of full-scale performance.

Since 1912 all of our floats have been based on tank experiments, and progress since then has been consistent. The general form of long float was evolved by Richardson in 1912-13, and, in the succeeding years, has come to be typical of American seaplanes. It has, however, been modified from time to time as conditions of service became more severe.

Some Practical Conclusions

The practical conclusions from our experience may be summarized briefly as follows:—

(a) The original single-float type with improved wing-tip floats has been found more rugged than the twin-float type for use in the flying school, gives better protection to the propeller from spray, is cheaper in first cost and in maintenance, and is more suitable for catapulting. It is not suitable for high-powered seaplanes of short span.

(b) The twin-float type has been found suitable for high-powered machines, for torpedo-carrying, and for rough-sea work.

(c) The small flying boat has been found dangerous for school work as compared with the tractor type on floats. The flying-boat type is necessary for very large machines when the twin-float design becomes structurally weak and heavy.

(d) The normal twin-floats should have at least 90 per cent excess buoyancy, although 80 per cent is enough for harbor work, or even less for the single float type.

(e) Our normal float has a beam about 0.13 to 0.14 the length, and a depth 0.75 of the beam. The center of buoyancy is 0.06 L ahead of the step. The Vee-bottom is 15 deg. for low-powered machines and 25 deg. for high-speed, high-powered types. The step depth is one-twelfth of the beam.

(f) The necessary beam of flying boats is approximately expressed by $B = 4.5\ \sqrt[3]{W}$. This gives about 100 lb. per inch width for a 10,000-lb. machine. For a single-float type, I use $B = 2.78\ \sqrt[3]{W}$, and for twin floats, $B = 4\ \sqrt[3]{W}$.

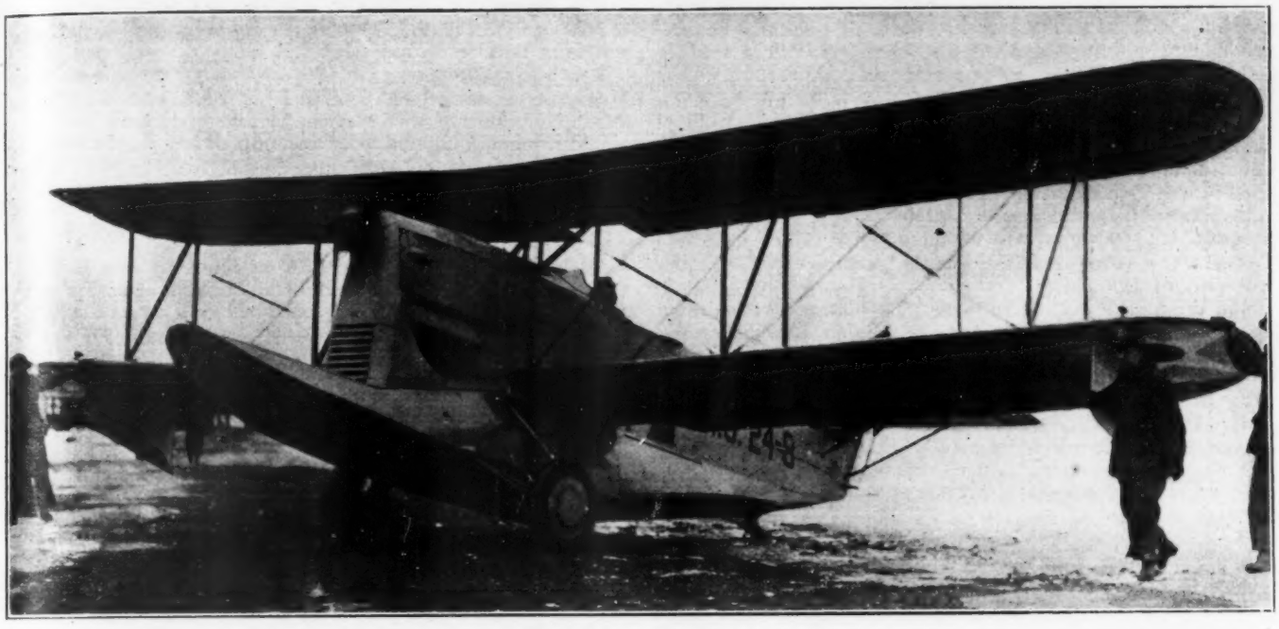
(g) The stability on the water of a float seaplane should be satisfactory if the lateral metacentric height is equal to the longitudinal metacentric height and exceeds $G.M. = 1.4\ \sqrt[3]{W}$. For single-float types and flying boats, the righting moment due to submerging a wing-tip float should be double the upsetting moment due to the tilt of the center of gravity.

These are quite arbitrary rules, based on experience, which I have found useful for preliminary design. When a seaplane has only a slight margin of power one must provide a relatively broader float, and when the stalling speed is very high, the float must be relatively narrow with a sharper Vee-bottom to prevent porpoising and to delay planing.

Successful Tests of the Loening Amphibian

An Important American Contribution to Airplane Design

A new type of American metal airplane, the Loening Amphibian, which has been secretly under development for over a year, made its first public appearance on Jan. 18 at Bolling Field, Washington, D. C. This ship, the first of an order of ten being built for the Army Air Service, was delivered by air piloted by Lieut. Wendell H. Brookley, who flew the machine from the Loening factory on the East River, New York City, to Mitchel Field. From there he made the cross-country trip to Bolling Field. It was the first cross-country flight ever made by an amphibian flying boat in this country. Lieutenant Brookley's trip was without incident and he reported that the new craft handled well in every way.



The new Loening Amphibian (400 hp. Inverted Liberty engine) taxiing at Bolling Field with Lieut. Wendell H. Brookley, A.S., at the controls

The following day Lieutenant Brookley demonstrated the capabilities of the Loening Amphibian to the Lampert Aircraft Investigating Committee with a masterful exhibition of flying. Taking off from the field with Fred Heckert, aeronautical engineer of McCook Field, as a passenger, Brookley landed shortly after to show the committee the adaptability of the craft as a land plane. Taking off again, the pilot folded up the landing wheels, and sideslipped down to the Naval Air Station at Anacostia which adjoins Bolling Field.

Four landings in the water were made altogether, and then, seeing Capt. Robert Oldys of the office of the chief of Air Service idling about in the air in a De Haviland, Brookley climbed and came alongside. Both pilots then threw the throttles wide open, and down the field they came, wing and wing, with huge streams of black smoke trailing from the exhaust. Soon Captain Oldys was far outdistanced and the huge amphibian had beaten the DH. The inverted Liberty motor in the amphibian was turning up 1,700 r.p.m. for a speed of 127 mi./hr.

After further tests at Bolling Field the ship will be flown to Langley Field, Hampton, Va., where very extensive tests are to be made in the roughest sea conditions, as well as flights over land, under the direction of officers of the A. S. Engineering Division.

Aviation experts, all over the world, have been awaiting with interest the demonstration of the Loening Amphibian, as it represents a very daring and novel metal design. For the first time, in the development of the art, the ordinary tractor type of biplane has been modified, so that the machine is capable of landing on either land or water, with ability to start from or alight on either, at a moment's notice. No extra floats or other devices are used, as the new design obtains its amphibious characteristics by the shape of the main fuselage body itself, the bottom of which is shaped like a flying boat hull. To this is attached a folding landing gear, an ingenious device, which is operated by an electric motor—the pilot merely throwing a switch in order to raise the wheels for water landing, or to lower them for alighting on the land.

As already demonstrated in flight, the new Loening Amphibian, in performance of speed and maneuverability, compares favorably with other airplanes of the same weight equipped with Liberty motors, such as the DH. But the deeper metal body and the unit construction give it a strength and rigidity which should greatly increase the safety of the crew in case of accident. In the sand test, conducted by the Air Service at Dayton, this body stood up without failure to a load of three or four times what is customarily applied.

In addition to the metal covering of the entire hull and body, the interior construction of the wings is largely metal, duralumin being the chief material used.

One of the most interesting features of the machine is the use of the Inverted Liberty Motor. This development places the bulk of the engine cylinders, etc. below the line of thrust of the propeller, so that clearance for the propeller is more readily obtained, and at the same time, the center of gravity of the weight is lowered several feet.

The Loening Amphibian weighs 3300 lb. empty and 4000 lb. loaded. It has seats for a crew of three and a gas capacity of 140 gal. sufficient for a non-stop flight of 700 mi.

An interesting feature of the machine is that the forward projection of the boat shaped body protects the propeller if landings have to be made in thick wheat fields or bushes, and prevents the machine from turning over on its nose, when hitting obstacles.

The new machine was designed and built by the Loening Aeronautical Engineering Corp. of New York.

The International Aeronautic Federation

An Outline of its Scope, Organization and Accomplishments

The letters "F.A.I." which so frequently occur in these columns, just as they do in foreign aeronautical magazines, are the symbol which represent the world over the pacific power of the International Aeronautic Federation (*Fédération Aéronautique Internationale* in French). In connection with the twentieth anniversary of this body, which falls this year, it is interesting to review here its origin, its present organization and its general functions, the more so as they are not generally known to the post-war aeronautic generation.

Foundation of the F.A.I.

The F.A.I. was founded in 1905 through the initiative of Count de la Vaulx of the Aero Club of France, Major Moedebeck of the Deutscher Luftschiffer Verband (German Aeronauts' Union), and Fernand Jacobs of the Aero Club of Belgium, with the approval of these bodies which had been formed a few years previously for the purpose of encouraging the sport of ballooning.

The original F.A.I. Statutes and Regulations were drawn up at a conference held at Paris in October 1905 under the presidency of M. Cailletet, then president of the Aero Club of France, and they were signed by representatives of the Aero Clubs of Belgium, France, Germany, Great Britain, Italy, Spain, Switzerland and the United States. Prince Roland Bonaparte was unanimously elected president of the new federation, and M. Cailletet was made honorary president. The other members of the first committee were as follows:

Vice presidents—Professor Busley (Germany), Fernand Jacobs (Belgium), Count de la Vaulx (France).

General Secretary—Georges Besançon (France).

Recording Secretary—Mr. Surcouf (France).

Treasurer—Paul Tissandier (France).

The permanent headquarters of the F.A.I. were established in Paris.

Functions of the F.A.I.

From the first the F.A.I. realized the great importance of codifying a number of rules and requirements which would be enforced by the federated Aero Clubs in the various countries so that aircraft performances may be judged by a single standard all over the world. This basic function of the F.A.I. was expressed in Art. 4 of its original Statutes as follows:

"The F.A.I. shall devote its activities to aeronautics, to its international regulation and, if required, to international aeronautical meets.

"The F.A.I. shall settle without appeal the differences which may arise between its member clubs or federations."

In the revised Statutes, adopted in 1920, this article was modified as follows:

"The F.A.I. is charged with the international regulation of the aeronautical sport so as to render comparable the results of all performances made in the course of contests.

"The F.A.I. will also concern itself with all aeronautical activities through the medium of its permanent or temporary commissions.

"The F.A.I. will settle without appeal the differences which may arise between the National Federations."

The activities of the F.A.I. may be briefly resumed as follows:

General Activities

Aeronautical Propaganda—The F.A.I. has engaged in vigorous propaganda to spread "airmindedness" and to contribute to the foundation in each country of a center for aeronautical activity. It has achieved gratifying results in this field, for while at its inception only eight countries were represented in the F.A.I., at present this body is composed of twenty-four national federations.

International Air Regulation—As aeronautics progressed, the necessity for the uniformity of national regulations became apparent. To satisfy this demand, the F.A.I. created a set of regulations which were accepted by the federations and are now universally enforced in aeronautical contests. World records, in particular, are checked according to the regulations of the F.A.I., which body officially records and publishes them in its quarterly bulletin.

Pilot's Certificates—A pilot's certificate for balloons and airships was created by the F.A.I. in 1906, and in 1908 an aviator's certificate was created. These certificates are officially recognized by most of the governments. On Jan. 1, 1917, the number of certificates issued was 6,269 for the entire world.

Customs Facilities Offered

Customs Carnet—To facilitate customs passage at the frontiers, the F.A.I. created in 1913 a customs carnet ("triptyque"). This was later supplemented by a customs booklet for touring aircraft, which has been officially adopted by the customs services of France, Holland, Italy, Roumania and Switzerland.

General Regulation of Air Traffic—In 1912 the law committee of the F.A.I. drew up the first project for the regulation of international air navigation. This project provided for general air traffic rules, the registration of aircraft, rules for lights and signals, landing and distress signals, etc. All of these provisions are found in the International Convention of Air Navigation which was promulgated ten years later.

Aeronautical Maps and Airdrome Plans—As early as 1906 the map committee of the F.A.I. established special aeronautical maps. These served in several countries as a basis for the official aeronautical maps that were issued many years later.

The F.A.I. is preparing for publication an atlas of the world's landing fields. The maps of the landing fields of France, Holland, England and Italy have already been published or are about to be published.

Lastly, as the final authority, the F.A.I. has several times had to render decision concering differences between its federated associations. Thanks to the perfect discipline of these bodies, questions of a serious nature, aggravated by an aggressive national spirit, have been smoothed over without difficulties.

F.A.I. Conferences

The following conferences have been held by the F.A.I.: 1905 in Paris, 1906 in Berlin, 1907 in Brussels, 1908 in London, 1909 special conference in London as well as regular meeting at Zurich, 1910 in Paris, 1911 in Rome, also special meeting in Paris, 1912 Vienna, 1913 Scheveningen. From 1914 to 1919 no conferences were held. In 1919 a special conference was held at Brussels to reorganize the F.A.I. (Germany and Austria were excluded until admitted into the League of Nations. Austria has already been reinstated.) This was followed by conferences in 1920 Geneva, 1921 Madrid, 1922 Rome, 1923 Gothenburg and 1924 Paris.

From year to year the number of delegates at the annual conference has increased, the importance of its labors has been enlarged and as a result these meetings have grown in importance. Various governments have become interested in this work and at the last three F.A.I. conferences the heads of the government have been kind enough to receive the delegates. In Sweden the king made a special trip from Stockholm to Gothenburg to attend the F.A.I. conference; at Madrid King Alphonso XIII attended the inaugural session, while in Italy, Marshal Diaz, Admiral Thaon di Revel honored the principal sessions with their presence. In Paris the President of the French Republic received the guests at the Elysée Palace.

The Board of Governors of the F.A.I., the list of its affiliated national clubs or associations and the membership of the various F.A.I. Committees are given below.

BOARD OF GOVERNORS OF THE F.A.I.

President: Count Henry de la Vaulx (France).
Vice Presidents: Fernand Jacobs (Belgium), Col. Merwyn O'Gorman (Great Britain), Arturo Mercanti (Italy), J. van den Berch van Heemstede (Netherlands), Ruiz Ferry (Spain), Colonel Amundson (Sweden), Frank S. Lahm (United States).
General Secretary: Georges Besançon (France).
Recording Secretary: Captain Hirschauer (France).
Treasurer: Géorges Besançon (France).

LIST OF NATIONAL AERO CLUBS AND FEDERATIONS AFFILIATED WITH THE F.A.I.

Argentine Republic—Aero Club Argentino. Galleria Güemes, Buenos Aires.
Austria—Oesterreichischer Aero Club. 10 Kärtnerring, Vienna.
Belgium—Aéro-Club de Belgique. 73, Avenue Louise, Brussels.
Brazil—Aero Club do Brazil. Avenida Rio Branco 183, Rio de Janeiro.
Chile—Aero Club de Chile. Casilla 2700, Santiago de Chile.
China—Aeronautic Federation of China, Pekin.
Czechoslovakia—Aero Klub Republiky Ceskoslovenska. Trida Marsala Foche cis. 8, Prague—Kral Vinohrady.
Denmark—Danske Aeronautiske Selskab. 33 Amaliegade, Copenhagen.
Finland—Suomen Ilmailuklubi (Finnish Aero Club). Arkadiagatan, Helsingfors.
France—Aéro-Club de France. 35, rue François-Premier, Paris.
Great Britain—Royal Aero Club of the United Kingdom. 3, Clifford Street, London, W.1.
Italy—Aero Club d'Italia. 183, Via del Tritone, Rome.
Japan—Taikoku Hiko Kyokukwai (Imperial Aero Society). Yurakucho, Kojimachi-Ku, Tokyo.
Netherlands—Koninklijke Nederlandsche Vereeniging voor Luchtvaart (Royal Dutch Aero Club). 39, Mauritskade, The Hague.
Poland—Polsky Aeroklub. 37, Avenue Ujazdowskie, Warsaw.
Portugal—Aero Club de Portugal. Palacio Palmella, 29, Largo de Calhariz, Lisbon.
Rumania—Aéro-Club Royal de Roumanie—9, rue Clémenceau, Bucharest.
Spain—Real Aero Club de España. Calle de Sevilla 12-14, Madrid.
Sweden—Kungl. Svenska Aeroklubben, Fenikspalatset. Stockholm.
Switzerland—Aéro-Club de Suisse. Palais Fédéral, Bâtiment Nord, Bureau 88, Berne.
Syria—Aéro-Club de Syrie et du Liban. Beyrouth.
United States—National Aeronautic Association of U.S.A. 1623 H Street N.W., Washington, D.C.
Uruguay—Aero Club Uruguayo. Plaza Independenicia 24, Montevideo.
Yugoslavia—Aéro-Club du Royaume des Serbes, Croates et Slovenes. Miloch Veliki 14, Belgrad.

LIST OF F.A.I. COMMITTEES

Technical Committee
Chairman: Col. Merwyn O'Gorman.
Secretary: H. E. Perrin.
Delegates: Colonel Van Crombrugge (Belgium), Mr. Forslev (Denmark), Lieutenant Sablé (France), Eng. Pavia (Italy), Major Jikemura (Japan), Dr. E. B. Wolff (Netherlands), M. Guimaraes (Portugal), Dr. Malmer (Sweden), Engr. Haefeli (Switzerland), John J. Ide (United States).

Law Committee
Chairman: M. Imbrecq.
Secretary: Pierre Bousquet.
Delegates: M. Briffault (Belgium), M. Talamon (France), Gordon Alchin (Great Britain), Cesare Goria-Gatti (Italy), Major Jikemura (Japan), Dr. Ph. Suyling (Netherlands), G. de Povoença (Portugal), Prof. Engstromer (Sweden), Max Schneeli (Switzerland).
Alternate: E. Pittard.

Air Touring Committee
Chairman: Arturo Mercanti.
Secretary: Paride Sacchi.
Delegates: P. de Crawhez (Belgium), M. Blondel la Rougery (France), Lt.-Col. Spensor D. A. Grey (Great Britain), Chev. Usuelli (Italy), Col. K. Tokunaga (Japan), Baron C. R. P. Crayenhoff (Netherlands), M. Guimaraes (Portugal), Lieutenant Florman (Sweden), Maj. Arnold Isler (Switzerland).
The United States delegate was Maj. Louis Brereton, A.S., American air attaché in Paris. Since his recall no new delegate has been appointed by the N.A.A.

Medical Committee
Chairman: Dr. Crouzon.
Secretary: Dr. Bêhague.
Delegates: Dr. Brabant (Belgium), Dr. P. Béhague (France), Maj. Hardy Vesey Wells (Great Britain), Prof. Amedeo Herlitzka (Italy), Colonel Toda (Japan), Dr. Berggren (Sweden), Henri Pachoud (Switzerland), Maj. E. L. Gros (United States).

Aerological Committee
Chairman: M. F. Jacobs.
Secretary: Major Jaumotte.
Delegates: Lieut. Col. Paul Renard (France), Sir Napier Shaw (Great Britain), Prof. Gamba (Italy), Col. K. Tokunaga (Japan), Prof. E. van Everdingen (Netherlands), F. Lindholm (Sweden), Prof. Duaime (Switzerland), Rear Admiral T. P. Magruder, U.S.N., (United States).
At the last summer session of the F.A.I. Capt. F. B. Upham, U. S., naval attaché, acted as American delegate. This officer has since been recalled and has been succeeded by Captain Johnson.

Map Committee
Chairman: M. Lallemand, of the Institute of France.
Secretary: Major de Béthune.
Delegates: Maj. Perry de Almeida (Brazil), Jaroslav Kopecky (Czechoslovakia), M. Blondel la Rougery (France), Lt. Col. Spenser D. A. Grey (Great Britain), Giovanni Negretti (Italy), Lieut. A. Aler (Netherlands), A. J. Telles d'Abreu Nunes (Portugal), Alfonso de Cisneros (Spain), Captain Bjornberg (Sweden), Henry Frey (Switzerland), Maj. Melvin Hall (United States).

Aerial Photography Committee
Secretary: Major Verelst.
Delegates: Dr. Joe von Hoffman (Austria), Capt. Hother Styrmer (Denmark), Marcel Chrétien (France), Lt. Col. J. T. C. Moore Brabazon (Great Britain), Ermanno Boltrano (Italy), Major Jikemura (Japan), J. H. Sar (Netherlands), Dominguez Clarte Antonio (Spain), Captain Santschi and M. W. Mittelholzer, alternate (Switzerland), Sherman M. Fairchild and Maj. Carlyle H. Walsh, A.S., alternate (United States).

Ascending the Throne via Plane

The landing of a mysterious airplane on the estate of Count Esterhazy at Tata Tovaros, Hungary, is reported by a Vienna newspaper. The plane carried two veiled women and one man as passengers. A waiting carriage conveyed them to the Esterhazy palace.

One of the veiled women, says the correspondent, is believed by the populace to have been former Empress Zita and they express the idea that she has come back to Hungary to pave the way for her son, Prince Otto, to ascend the Hungarian throne.

The correspondent also says the pilot of the plane was recognized as Zimmermann who brought the late Emperor Charles to the same spot the second time he returned to Hungary after he was sent into exile.

Air Liners at the Paris Aeronautic Salon

Three Latecoere Planes Compared and Dewoitine D14 Described

Commercial aviation was greatly overshadowed at the Paris Aero Salon by the number and variety of military ships shown, although the public was given a comprehensive picture of the progress of French commercial air transport through striking posters, bold type statistics and panoramic views which the various air navigation companies had on their stands.

Air Lines Build Own Ships

From the constructional viewpoint no strikingly novel air liners—that is, airplanes designed for regular airway operation—were exhibited. It is significant, however, that the two firms which showed the greatest enterprise in this class of construction—Farman and Latécoère—both operate air lines through subsidiary enterprises. Farman exhibited the well proved Jabiru multi-engined transport which is by now well known to our readers; Latécoère had on exhibit three air liners one of which, the LAT15 is similar in general arrangement to the Jabiru, while the other two are single-engined tractor monoplanes. One of these, the LAT16 has already been described in AVIATION. Dewoitine exhibited a single-engined, strut-braced cabin monoplane, Type D14, while Caudron showed the cabin portion of the C81 three-engined air liner which is used by the Franco-Rumanian Air Transport Co. on the Paris-Constantinople line.

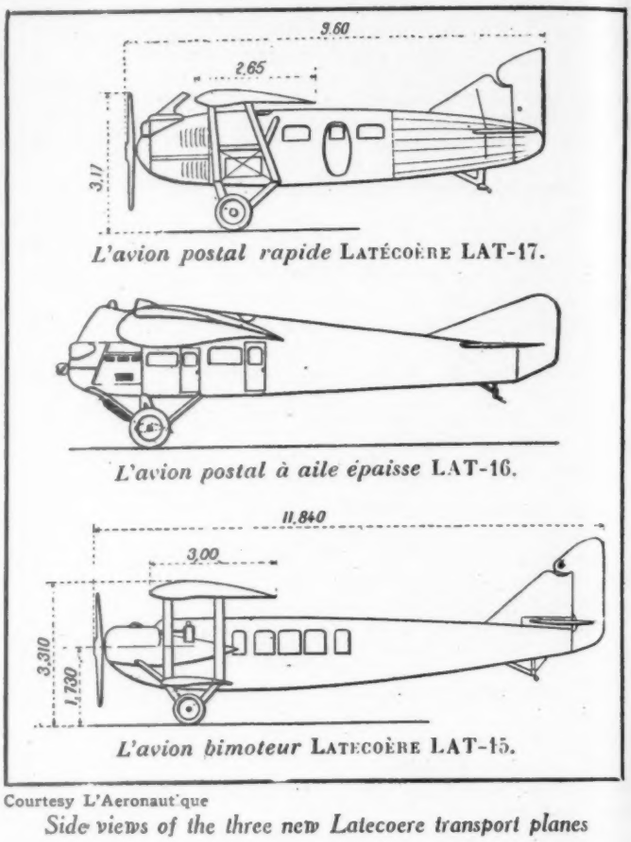
This brief enumeration indicates all the air liners shown at the Paris Salon, though this list does not include other commercial ships, such as training planes, touring planes and two light planes or sport planes. Of these very few deserve special comment as their construction generally followed conventional ideas. The new air liners, however, merit a closer examination. What follows should be read in conjunction with the full table of specifications of aircraft exhibited at the Paris Aero Salon which was published in the Jan. 12, 1925, issue of AVIATION, as limitations of space make it impossible to reprint for each ship the characteristics already published. For the same reason, no attempt is here made to give a complete description of each new ship: instead, only the highlights will be touched upon and such features emphasized that really merit consideration by reason of their novelty.

The New Latecoere Air Liners

The Latécoère firm of Toulouse, which since 1920 operates the France to Morocco airline with marked success, showed beside the LAT16 mail plane (recently described in AVIATION) the LAT17 fast mail plane and the LAT15 twin-engined passenger carrier. The LAT16 was produced for the Toulouse-Casablanca airway (1200 mi.) with a view to covering that distance between dawn and dusk. When practice showed that this ship was not fast enough to insure such a service under regular operating conditions, the LAT17 was constructed. This ship is equipped with a 300 hp. Renault engine and has a top speed of 120 mi./hr., carrying a pilot, fuel for a 450 mi. trip and 1,000 lb. of pay load. While the plane is primarily designed to carry mail—which is the chief source of revenue on the France-Morocco airway—it has a cabin for four passengers. This cabin is, according to *L'Aeronautique*, "restricted and simplified," from which it may be concluded that the passenger accommodation is rather cramped.

However, from the designer's point of view, it is worth while comparing this ship with the LAT16 which it is called to replace. The LAT16 is a pure cantilever monoplane with very thick wing roots which practically grow out from the fuselage, and with a thick section wing which is deep enough to permit the installing of mail coffers and fuel tanks. Its cargo capacity, 106 cu. ft., is a desirable feature for bulky freight: unfortunately, this feature was purchased at the cost of high structural weight, caused both by the depth of the wing roots and the cubical contents of the cabin. The result was that although this ship is equipped with a 400 hp. Renault engine it only has a top speed of 112 mi./hr. and its pay load is only 770 lb.—whereas the LAT17 carries half a ton of pay load with 100 hp. less and yet has a top speed of 120 mi./hr.

This result was accomplished by substituting for the thick cantilever wing one of medium section which is braced to the fuselage in parasol fashion by a number of steel struts. The fuselage itself is remarkable for its unbroken streamline



Courtesy L'Aeronautique

Side views of the three new Latecoere transport planes

which is reminiscent of the Curtiss Oriole. Apparently, the weight saved by these changes more than over-balanced the drawbacks of external wing struts, as the performance tellingly shows, all of which was worth the demonstration.

The LAT15 twin engined passenger carrier is equipped with two 270 hp. Lorraine-Dietrich engines which are mounted on wing nacelles placed very close to the fuselage and which drive tractor propellers. The fuselage as well as the nacelles are of good streamline form. The pilot is seated in the nose of the fuselage, from where he has excellent visibility. Underneath and behind the pilot's cockpit there is a cabin for six passengers, but the pay load is much larger than their weight as ample holds for freight and mails are also provided. For a range of 310 mi. the useful load (minus fuel) is 2640 lb., while for a range of 1200 mi. the useful load (m.f.) is 780 lb. In a test flight this ship climbed on one engine, developing 220 hp., with 1760 lb. of useful load, while in another test it was flown for one hour at 3300 ft. again on one engine with a useful load of 2350 lb. It will be seen from these figures that the LAT15 has already given some striking proofs of its practical usefulness. The high speed of the ship is 110 mi./hr.

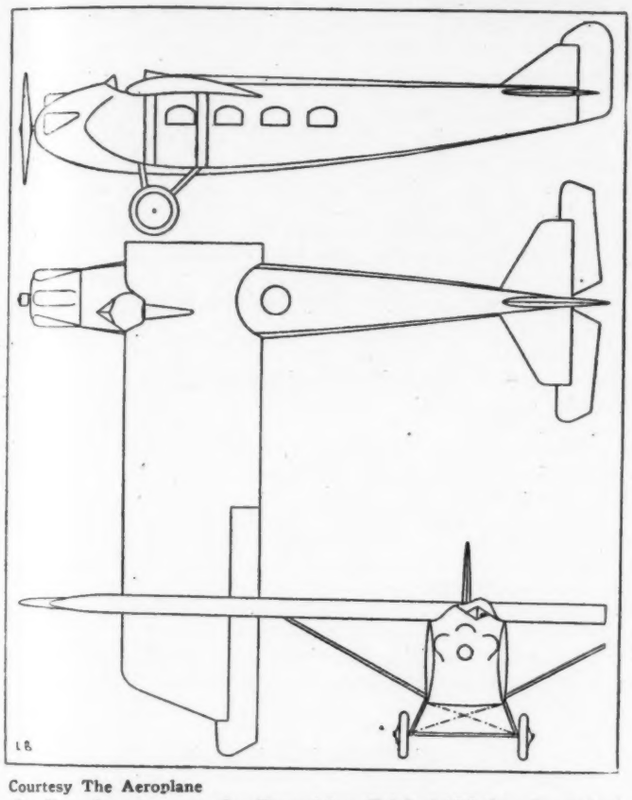
Constructionally the LAT15 is of the composite type, with duralumin wing spars, wooden ribs and fabric covering, while the fuselage is a duralumin tube structure with duralumin skin in front and fabric covering in the rear. The engine

nacelles are carried on small wing stumps like on the Jabiru, and steel tube bracing struts slope outward from there and lead to the upper wing. Under each engine there is a two-wheeled landing chassis.

This machine was built for those sections of the France-Africa airway which will require particularly dependable operation, namely the stretch from Casablanca to Dakar, French West Africa, which follows a long deserted coast line.

Dewoitine Commercial Monoplane

The Dewoitine firm is best known in this country for the gliders and the light planes which it has developed. It will be remembered that Georges Barbot brought one of these over



Courtesy The Aeroplane

Outline drawings of the Dewoitine D14 (450 hp. Lorraine) transport plane

in the summer of 1923 and that his flights aroused much public interest and greatly stimulated the light plane movement in this country. In France, however, the Dewoitine firm is chiefly noted for its metal construction and its high speed ships. Although quite a new firm, it has gained a very favorable reputation with its D1 pursuit ship of which 150 are on order for the Italian Air Force.

Dewoitine's latest product, the D14 commercial passenger plane, was exhibited at the Paris Aero show and received much favorable comment. The machine is a six passenger monoplane with a 450 hp. Lorraine-Dietrich engine. Contrary to usual Dewoitine practice, the D14 is built of wood, which seems rather regrettable, for there have been few commercial planes built of metal and we believe that the Dewoitine firm could have turned out a good machine. Metal construction, however, for the small quantities of transport planes which are needed in commercial work seem to be prohibitive on account of the cost.

The first commercial machine built by the Dewoitine is essentially a sturdy and practical ship with no very extraordinary features either in performance or in construction. However, the important factors in a commercial plane seem to have been well taken care of. The pilot has almost perfect visibility, the horsepower/load ratio would indicate a considerable reserve of power, and the construction is simple and accessible, the motor and other parts being easily demountable. Lastly, the passengers are comfortably seated and have an unobstructed view through large windows.

Wing Structure—The span of the Dewoitine is 61 ft. 8 in. with a chord of 9 ft. 6 in. or an aspect ratio of 6.7 to 1. The chord remains the same throughout the length of the wing and the thickness does not vary except at the extreme end where it is tapered off. The wing has a greater span at the trailing edge than at the leading edge and the balanced ailerons extend out beyond the wing tips. The ailerons are very narrow being 16 ft. 7 in. long and 1 ft. 7 in. wide.

The wing is built in two parts and is attached to the upper longerons of the fuselage. Two struts extend up from each side of the lower fuselage longeron to about the middle of the wing forming a rigid but simple system of bracing. The landing gear struts also are attached to the fuselage at a point immediately in front of the wing struts. The wing beams are of the box spar type. Each wing has about twenty ribs of the N stringer type reinforced by three plywood gussets. Box type compression members separate the main beams at the wing roots and also at the point where the gasoline tanks are inserted.

The Fuselage—The fuselage is divided into three parts which are readily removable and interchangeable. The forward part contains the metal motor bed and the pilot's seat. The latter is slightly to the left of the center of the fuselage but the pilot can easily see over onto the right side. This nose is fastened to the forward part of the cabin at a point which corresponds to the attachment of the forward wing spar on the top of the fuselage and of the forward landing strut on the lower part of the fuselage. The cabin is built of formers and covered with plywood and does not depart far from standard practice. It is divided into three parts, the forward part being reserved for baggage but large enough to permit of the fitting of two passenger seats if necessary. The central cabin seats four passengers each of whom has a large oblong window. The rear section contains a toilet and also the door for the passengers. There is a separate door for the baggage compartment. There is an emergency exit in the top of the fuselage and also a man hole in the floor through which a passenger may jump if he so desires. Presumably the passenger would don a parachute before jumping. The rear of the fuselage is fastened to the four longerons of the cabin. The horizontal stabilizer is adjustable and the elevator is balanced.

The landing gear is simple and strong, with a solid axle and Vee strut on either side. The top ends of the strut are fastened to the lower longerons at a point immediately in front of the wing struts. The forward landing struts telescope and the shocks are absorbed by a double helical spring which is surrounded by a streamlined metal casing.

The Power Plant—The standard engine for the D14 is the 450 hp. W type 12 cylinder Lorraine-Dietrich, but as the nose of the fuselage is removable, any other engine of equivalent power may be substituted. Lamblin radiators are used. The gasoline tanks are set in the wings and can be quickly emptied while in flight.

The machine has not yet been officially tested in flight, but it is estimated to have a high speed of 120 mi./hr. and a low speed of 50 mi./hr. The designed pay load is 1320 lb.

A Bristol Jupiter Success

The 400 hp. Bristol Jupiter engine, the well known English air-cooled radial type which for some time past has been manufactured in France under license by the Gnome-Rhone Motors Co., will shortly be built in Italy and Czechoslovakia under a similar arrangement. The manufacturing rights for Italy have been acquired by the Italian government, while in Czechoslovakia the Jupiter will be manufactured by Laurin & Klement, well known automobile manufacturers.

Album of British Aircraft

Our English contemporary, *The Aeroplane*, has issued an attractive album which contains specifications and 46 illustrations, produced in fine photogravure, of the most modern British airplanes and seaplanes.

Air Service Awards

Gasoline

The contract for furnishing 84,000 gal. aviation gasoline for west coast delivery, bids for which were opened Dec. 22, under cir. CAS 63, by the chief of air service, Washington, has been awarded to Union Oil Co. of California, Los Angeles, item 1a, 15.764c; 1b, 14.96c; 1c, 16.48c; total $13,329.68.

Casings and Tubes

The following awards have been made by the chief of air service, U. S. Army, Washington, for 400 straight side pneumatic airplane casings and 550 inner tubes for airplane tires, under cir. CAS-60, bids for which were opened Dec. 22:

B. F. Goodrich Co., item 48, $8.40.

Goodyear Tire & Rubber Co., item 49, $43.40.

United States Rubber Co., item 50, 96c; 51, $4.90.

Shock Absorber Cord

The bid of B. F. Goodrich Rubber Co., Akron, Ohio, has been accepted by the chief of air service, U. S. Army, Washington, for 60,000 ft. elastic cord for shock absorbers, under cir. C.A.S. 59, bids for which were opened Dec. 22, item 52, 11.08c; 53, 15.2c; 54, 4.22c; 55, 6.52c; total, $7,341.90.

Wheel Assemblies

The contract for furnishing 40 wheel assemblies without tires and tubes, under cir. C.A.S. 54, bids for which were opened Dec. 22, by the chief of air service, U. S. Army, Washington, has been awarded to G. Elias & Bro., Buffalo, N. Y., item 181a, $60.50; 181b, $62; total, $2,465.

Carburetor Parts

The bid of the National Steel Products Co., Dayton, Ohio, has been accepted by the chief of air service, U. S. Army, Washington, under cir. CAS 50, for 100 sets of parts for carburetors at $35, bids for which were opened Dec. 9.

Engine Parts

The bid of the National Steel Products Co., Dayton, Ohio, item 41, 75c; 42, 17c; 43, 16c; 44, 19c; total $432, has been accepted by the chief of air service, U. S. Army, Washington, for furnishing 300 oil tank vent connections for Hispano breather tube opening and 1,200 primer tube assemblies, under cir. QR-68, bids for which were opened Dec. 22.

Spare Parts for Martin Bombers

Awards for spare parts for Martin Bombers have been made under cir. C.A.S. 45, by the chief of air service, U. S. Army, Washington, bids for which were opened Dec. 8, to:

Aerial Service Corp., Hammondsport, N. Y.; G. Elias & Bro., Buffalo, N. Y.; Eberhart Steel Products Co., Buffalo, N. Y.; Curtiss Aeroplane & Motor Corp., Garden City, L. I., Aeromarine Plane & Motor Co., Keyport, N. J.

Instruments and Parts

The following awards have been made by the chief of the air service, U. S. Army, Washington, for airplane instruments and parts, under bids opened Nov. 25, cir. 29:

Bid 1. National Steel Products Co., Dayton, Ohio.

2. Pioneer Instrument Co., Brooklyn.

3. Motometer Co., Long Island City, N. Y.

4. Star Compass Co., Dorchester, Mass.

5. Chas. Fischer Spring Co., Brooklyn.

Item 3. 150 float assemblies, $1.85, bid 1.

6. 25 indicators, rate of climb, $76, bid 2.

7. 150 head assemblies, universal gasoline level gage, $11, bid 1.

Thermometers, aircraft vapor pressure type:

10. 150 with part No. 030045-2, $6.25, bid 3.

11. 200 with part No. 030045-3, $6.40, do.

12. 50 with part No. 030045-4, $7.10, do.

13. 50 with part No. 030045-5, $7.40, do.

51. Remodeling 500 aircraft compasses, type B to type B-3, $10, bid 4.

52. Remodeling 100 aircraft compasses, type B to type B inverted, $15, do.

61. 500 tachometer driving shafts and casings, $2.54, bid. 5.

Bomb Releases

The following awards have been made by the chief of air service, U. S. Army, Washington, under cir. CAS-56, for bomb releases, bids for which were opened Dec. 22:

Star Machine Tool & Die Works, 205 Lafayette St., New York City, item 13a, 280 external bomb racks, $93.65.

Superior Die Tool & Mfg. Co., Columbus, Ohio, item 14, remodeling 125 type B1 wind vane sight into wind vane sight assemblies, $6.79; 29, 200 bomb rack cable clevises, 38c.

Avon Tool & Machine Co., Dayton, Ohio, item 6, 50 bomb release handles, $89.64.

Miscellaneous Airplane Parts

The following awards have been made by the chief of air service, U. S. Army, Washington, for miscellaneous airplane parts, under cir. CAS 51, bids for which were opened Dec. 9:

Eberhart Steel Products Co., Buffalo, N. Y., item 1, $6.48; 12, $177.54; 13, $15.24; 14, $16.75; 15, $27.04; 16, $24.51; 20, $8.92; 22a, $4.66; 22b, $4.66.

Cox-Klemin Aircraft Corp., Baldwin, L. I., item 3, 70c; 4, 24c; 5, 70c; 6, 32c; 7, 32c; 9, 48c; 11, 96c.

Curtiss Screw Co., 17 Gull St., Buffalo, N. Y., item 21, 3c.

Curtiss Aero & Motor Co., Garden City, L. I., item 23a, $24.70; 23b, $24.95.

Turnbuckle Assemblies

The following awards have been made by the office of the chief of air service, U. S. Army, Washington, for turnbuckle assemblies, under cir. CAS 61, bids for which were opened Jan. 5:

Aero Supply Mfg. Co., 461 1st Ave., New York city, item 119, 1,000 short clevis eye barrel turnbuckle assemblies, 50c; 120, 1,000 long do, 58c; 121, 1,000 do, 70c.

Eberhart Steel Products Co., Buffalo, N. Y., item 122, 500 barrel eye for pin short eye turnbuckle assemblies, 34.8c.

Naval Aviation Awards

Airplanes

CS2 airplanes, The Glenn L. Martin Co., Cleveland, Ohio, $1,030,311.48.

Propellers

Hartzell Walnut Propeller Co., Piqua, Ohio, aircraft propellers, $84.90 ea.; total, $8,490, under schedule 900-9046, Dec. 29.

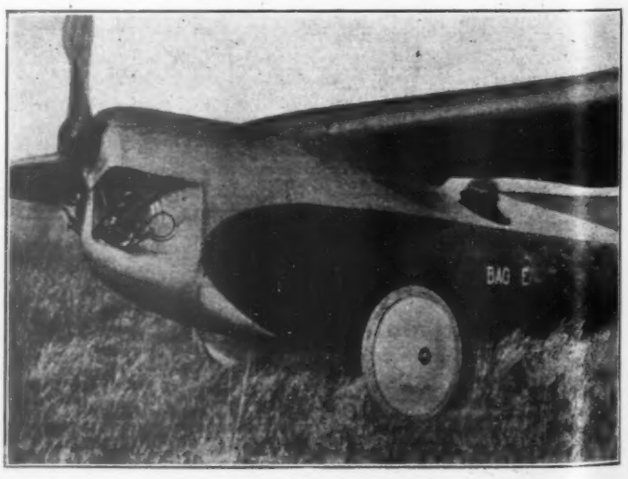
Gasoline Pumps

The Douglas Co., Santa Monica, Calif., gasoline pumps, $970, under schedule 900-9050, Jan. 7.

Glenn L. Martin Co., Cleveland, hand gasoline pumps, $120, under schedule 900-9072, Jan. 5.

General Brancker Reaches India

General Sir Sefton Brancker, Controller of Civil Aviation in Great Britain, who left Stag Lane airdrome (London) on Nov. 20 in a DH50 piloted by Alan Cobham en route for India, reached Karachi on Dec. 30. General Brancker's purpose in flying to India was to make arrangements for the imperial air route which is to be opened up in the near future.



The German B.A.G. light plane on which Pilot Botsch flew from Darmstadt to Berlin, covering 310 mi. in 3½ hr.

Regulation Benefits Canadian Aviation

Editor, AVIATION:—

We note in your issue of Dec. 8 a letter from R. R. Blythe New York, discussing the need or rather descrying the need for regulation of Commercial Aircraft, and are inclined to the opinion that Mr. Blythe composed this letter without giving the subject the thought which it deserves.

His comment regarding conditions in the United States we do not propose to take exception to as while it is our opinion that this important phase of Aeronautics is in a chaotic state, we do not feel we are justified in making destructive criticism, and not being sufficiently familiar with the feeling or sentiment of Commercial operators there, are unable to make constructive suggestion. We do, however, take strong exception to Mr. Blythe's criticism of conditions in Canada. We feel he is lacking in a knowledge of facts when he instances Canada and England as examples of the detriment of Government Aircraft Regulation.

By what stretch of the imagination he arrives at the conclusion that commercial development is being retarded by regulations which are in force here we cannot understand. We are reasonably conversant with commercial operations in the United States and are in close touch with similar operations in Canada, and while the number of commercial machines in operation in the aggregate cannot compare with the United States, we feel bound to state that in our opinion the commercial operation of aircraft in Canada shows more progressive development and is on a sounder footing than any operations which we have knowledge of in the United States, and this condition we believe is very largely due to the beneficial effects of sound Legislation controlling maintenance and operation of aircraft.

We instance the large civil operations being carried out by our Department of National Defence in connection with photographic mapping of Northwestern Canada, and general forestry work such as Fire Patrol, etc., etc., throughout the Provinces of Manitoba, Saskatchewan, Alberta and British Columbia. We also instance similar operations being conducted by Commercial operators throughout Ontario and Quebec and we doubt indeed if Mr. Blythe can instance Commercial operations in the States which would compare in point of economic value and efficiency.

It is true that we have no transportation services between centers of population but this is not due as Mr. Blythe states, to the crippling effect of Legislation, but to the fact that owing to the comparatively small size of our cities there is not a sufficient volume of traffic to justify aircraft transportation service between larger centers, and for this reason we question whether any such services can be expected for many years.

As you are probably aware, Canada is a signatory to the Convention relating to International Air Navigation, and since 1920 have operated under regulations then adopted covering maintenance and operation of commercial aircraft. These regulations have been amended from time to time when it has been found that conditions warrant such amendments and we believe today that any country not operating under these or similar regulations is placing unnecessary handicaps on the industry and falling short of her duty to protect the public.

We are the largest commercial aircraft operators in Canada and it is not our experience that the enforcement of our regulations in any way retards our work. Rather it is beneficial and we find that having an organization similar to our Department of National Defence, Air Service, at Ottawa, administering these regulations in a sympathetic manner is of very material assistance to us in maintaining our machines in an airworthy condition and in solving the many operating problems which arise.

We cannot stress too strongly our resentment of Mr. Blythe's criticism and from the campaign for sane Government regulation of aircraft which has been conducted from time to time through the medium of your excellent paper and other technical journals throughout the United States we are of the opinion that you will agree that Mr. Blythe's conclusions regarding the detriments of such Legislation are entirely unfounded and if he has the true interests of Aviation at heart he cannot but agree that until the United States adopt regulations which will curtail the operation of gypsy pilots flying unairworthy machines at great risk to the public that he will not get support from the public which will permit of the growth and development which can rightly be expected for this modern method of transportation.

Trusting that you will see fit to print the above objections and wishing your Journal every success in the future, we are,

LAURENTIDE AIR SERVICE, LIMITED
H. D. Wilshire, Managing Director

New Valve for Gasoline Engines

Practical solution of the major portion of the motorists' carbon and engine knock troubles as well as the introduction of a more efficient type of gasoline engine is forecast in the introduction of the Howard-Brewer Cuff Valve Engine to the market.

Automobile interests have been casting about for several years for a new type of motor or valve gear commanding larger power with a more economical operating cost than the present poppet valve type is able to deliver. From the inquiries received by the owners of the patents it is evident that the new cuff valve engine is a long step forward in the proper direction if not the final reduction of the gasoline motor to its simplest phase.

The aviation rights of the Howard-Brewer valve mechanism have already been acquired by Harold F. Pitcairn, Philadelphia's leading factor in commercial aviation. Work is now under way converting a standard aviation engine to the new system under the technical direction of Capt. R. W. A. Brewer, internationally famous automotive engineer, at the Aeronautical Research Laboratories, a subsidiary of the Engineers Development Co., Inc., of Philadelphia of which Captain Brewer is president.

Captain Brewer was engaged some years ago to report on the possibilities of the cuff valve system by a London group of financiers and has followed subsequent developments closely. He is satisfied that the Howard idea has great potentialities and he has made several adaptations of it for replacements or conversions of valve system on all stock engines including a Ford.

Future of Zeppelin Plant

A report that the Zeppelin Company is negotiating with the Italian government for a plant in Milan has been denied in official Italian quarters. At the same time reports from Germany were received that only in the event that the Conference of Ambassadors decided on suppression of the Zeppelin works at Friedrichshafen would the Zeppelin Company "consider the advisability of transferring its works abroad," indicating that no final decision had yet been reached, and that in any case the works would not necessarily be transferred to Italy rather than to some other neighboring country.

It was further stated at the Ministry of Foreign Affairs in Rome that it was highly doubtful whether the Italian Government would support such a patent attempt to evade clauses of the Versailles treaty, though it would be difficult to prevent the Zeppelin Company setting up in business in Italy if it formed an Italian Company with participation of Italian capital in conformity with Italian laws, as already has been done by the German Dornier company, which has a plant at Marina di Pisa.

Once More, the Parachute

M. Pitot, a French test pilot, was making a first flight on a new experimental plane at Villacoublay, near Paris, on Dec. 29, last, when for some unaccountable reason his ship got into a nose dive at 1200 ft. As soon as the pilot found that the ship was uncontrollable, he made use of his parachute and landed safely while the machine caught fire on hitting the ground and burned up.

The use of parachutes has now been made obligatory on all experimental machines by the French air department and there is much agitation in the French aeronautical press to extend this ruling to all military and naval aircraft.

25 Years Building Zeppelin Airships

A Review by Raffe Emerson

Under the above title, there has just appeared a book (Quarto, of only 83 pp., and 1 plate) compiled under the direction of Dr. L. Duerr, Director and Chief Engineer of the Zeppelin Co. (Germany), which is the most valuable contribution to airship literature that has yet been printed. We understand arrangements for its translation for the English speaking publics, are about completed. There are 196 illustrations, mostly fine copper halftones, and three tables. The book, even in German, because of the illustrative material, is a worthwhile addition to the desk-shelf of any man interested in air transport, in engineering or manufacture, in current events.

The book has no "swank," Prussian or otherwise. Very few of its statements will not stand the most searching scrutiny and comparison. The information given—much of it entirely new to the lay public—is almost without exception reliable in every particular, and not subject to the fault of permitting unjustified inferences by omission. The exceptions noted by the writer are so trifling, as not to bear on his high regard for this contribution to scientific literature—readably written,—and for the straight-forward modesty of the men who were concerned in the work.

The book is published by the Verein Deutscher Ingenieure (equivalent to our American engineering societies all rolled into one), and the first chapter, a description of the ZR3, so-called LZ126, is a reprint of the paper presented before that Society in May 1924. This chapter will not be reviewed at this time, as a technical description of this ship will be published in these columns at an early date.

Chapter II, "Introductory remarks on the principles on which the Zeppelin airship was originated," is short, and says little. See Doerr, Vissering, and Eckener (in Eyb's Delag-Fuehrer), for additional information as to the development of basic ideas.

Chapter III, "Development of the Z-Airship in shape, size, and performance," is the best presentation yet made of actual airship development, and concise report of performance.

Chapter IV, "Construction development, Structural materials, Structure, Ship construction, Power plant, Equipment" is the body of the work, using 52 of its 83 pages, plus the plate of the ZR3's lines and sections. This chapter is most informative to technicians of all kinds; and particularly, besides airship specialists, to bridge-builders, designers of towers, metal airplane constructors, metallurgists, and to automotive engineers.

The first Zeppelin (like the ill-fated Schwartz 1893-'7 all-metal airship) was built with a frame of commercial aluminum. The second ship used an aluminum-zinc alloy of greater tensile —but poor electrolytic—qualities. It was not until 1909 that Wilm made available his discoveries in the working and tempering of the ternary aluminum-copper-magnesium alloy, which have given the world a new industrial metal of great importance, and have increased the economic value of projects like Muscle Shoals. But the Zeppelin ships were not made of this alloy until the LZ26 (Z XII, German Army) was launched in December 1914. It is curious that the first British rigid airship, whose design was commenced in 1909, and which was constructed in 1911-'12 under the supervision of General Masterman and Commander Boothby, was made of "duralumin" (the trade-name of the alloy), furnished by Vickers who had the British rights by arrangement with Düren. The American rights were sequestrated by the Chemical Foundation and licensed successively to the Aluminum Co. of America, and to the Baush Machine Tool Co., both of whom excell the English, and even the German products, in general properties and workmanship.

The chapter proceeds with a description of the sectional elements used, the lattice forms, their spacing, the girder sections (developing from narrow flat girders to those of triangular section, at first of narrow-base isosceles type; then on to equilateral, to "W," and even to deep rectangular for certain purposes), the riveting, their tests, the new pressed lightening-hole type, so prevalent in the ZR3.

In this chapter, joints are well illustrated, frame and shear-wiring arrangements in the progressive ship-types, transverse wiring, and keel. Then follows a discussion of the steering surfaces (or directional and diving rudders), a brief account of the gas-cells, and a more detailed description of the valves, the outer cover, a well illustrated description of the cars, followed by full data on motors, gears, propellers, radiators, and fuel supply. The radio, and electrical equipment descriptions are quite full.

It cannot be said that anyone could build a Zeppelin airship from this book. But that is not to be expected. The book is, in understandable language and illustration, a gift from the great Zeppelin Foundation to the World: an exposition of the art of rigid—as Mr. d'Orey has more aptly termed them, "structure" airships—which should be possessed by everyone concerned in the art.

Besides the chapter on Zeppelin performance and development, which is to appear shortly in the pages of AVIATION, there will be a complete technical description of the ZR3.

Note.—For convenience we mention here a few of the outstanding books in which information valuable to airship men is available:

Jane—"All the World's Aircraft."
d' Orey—"Airship Manual."
U. S.—"Aircraft of Belligerents, in the year 1914."
"Kriegsluftflotten."
Pratt—"Commercial Airships."
U. K.—"Notes on Airships for Commercial Purposes."
Stahl—"Rigid Airships" (N.A.C.A. 237).
Doerr—"Der Luftschiffbau" (in Moedebeck).
Kohlman—"Das Zeppelinluftschiff."
Durr—"25 Jahre Zeppelin-Luftschiffbau."
Vissering—"Zeppelin. The Story of a Great Achievement."
Maitland—"The log of H.M.A. R34."
Bianchi—"Lezioni di Aeronautica."
Rotch—"Charts of the Atmosphere."
Teed—"Hydrogen Production."

National Air Policy Suggestions

Editor, AVIATION:—

Concerning a National Air Policy there is one phase of aviation which seems to be sadly neglected by the Government and the manufacturers alike — and that is the light plane.

Economy is perhaps the biggest factor in the world today and it is a very important consideration in the development of commercial aviation. At present we are using for training and refresher purposes planes equipped with motors of from 150 to 200 hp., and sometimes even DH's with the Liberty motor.

The British two-seater light plane competition proved that a good training plane can be built which will have an adequate performance with an engine of 1100 cu. cm. It is true that considerable trouble was experienced at Lympne, due largely to the high engine speeds, but there was nothing which cannot be overcome.

Given a two-seater light plane with air-cooled motor, I venture to say that half an hour of actual flying can be put in on the amount of gasoline and oil consumed while warming up a water-cooled engine preparatory to a training flight. The Government seems to have completely overlooked this particular form of economy while it is engaged in attempts to save money elsewhere. And so, as the Government has apparently no use for light planes, aircraft manufacturers think as a rule that the demand among civilian pilots would hardly justify the expense of producing a really high class light plane that would be in keeping with their other products. Is there no remedy for this condition?

The writer believes that the Pulitzer Trophy as an incentive for the production of purely high speed machines has accomplished its purpose and that, if it were put up in a competition where speed, altitude economy and endurance would be factors, it would prove equally useful. Such a competition, to be of real value, should be for two-seater light planes equipped with dual control and having engines of a maximum piston displacement of 3,000 cu. cm. (3 liters) or 183 cu. in. With a view to economy the engines should be air-cooled.

The British light two-seaters put up good performances with engines but little more than one third this size and we can profit by their experiences.

D. F. C.

LIGHT PLANES AND GLIDERS

Edited by Edmund T. Allen

An Australian Light Plane

The first Australian competition for two-seater light planes was held during the first week of December, last, at Richmond, New South Wales. The results are not yet available, but the following information regarding the Wackett "Warbler," one of the light planes entered in the competition, will be of interest.

This little ship was built in the experimental station of the Royal Australian Air Force at Randwick, N.S.W., by Squadron Leader L. J. Wackett, who is in charge of that establishment. The main dimensions of the Warbler are as follows: Span 40 ft., overall length 19.5 ft., height 7.5 ft., weight empty 360 lb., useful load (designed 360 lb.) The ship is fitted with a 2 cyl. horizontal opposed engine designed and built by Mr. Wackett which develops 40 hp. on a cylinder capacity of 1490 cu. cm. and with a mean effective pressure of 170 lb./sq. in. The weight is 88.5 lb.

The fuselage is built up spruce longerons with spruce struts and diagonal bracing strips. The front half of the fuselage is covered with Queensland maple, and the rear half with fabric. The wings are built up on two spruce box spars with maple ribs, the whole being fabric covered. The four bracing struts which connect the wings with the fuselage are steel tubes. The tail unit consists of a biplane tail plane and twin fins and rudders. The landing gear consists of an axle and two wheels which are sprung direct to the bottom longerons of the fuselage.

The Warbler has a speed range of 40-80 mi./hr., fully loaded.

New DeHavilland Light Plane

The De Havilland Aircraft Co., Ltd., of Edgeware England, will shortly turn out a new light plane, type DH60, which will seat two persons and have an engine developing between 50 and 70 hp. According to *The Aeroplane,* it seems that this engine is based on the Walter engine, produced in Czechoslovakia, which will be built under license in England by Vickers, Ltd. The Walter 50-60 hp. engine is a 5 cylinder radial air-cooled type which has put up some remarkable performances in Czechoslovak airplanes.

The DH60 will be a tractor biplane with folding wings which can be folded in three minutes, in which case the span for housing purpose will only be 10 ft. The cockpit will be fitted with dual control and there will be room for a large suit case weighing 40 lb. The gasoline system will be gravity operated. The tanks will hold fuel for 3½ hr. and fuel consumption will be about 20 mi./gal. The high speed will be 90 mi./hr. and the landing speed 38 mi./hr. The weight loaded will be 1,350 lb.

It is interesting to witness the De Havilland company, which produced a successful light plane around the 700 cu. cm. Douglas engine, evolve toward a more highly powered light plane. It is stated that in this firm's view the present type of light plane is too small to be a practical proposition for cross country work.

Flying Instruction Made Cheap

Budding aviators will be able to acquire proficiency in flying and a pilot's license for $25 under a new scheme inaugurated by the Royal Aero Club of the United Kingdom.

A new section of the club is being formed, called the Royal Aero Club Light Aeroplane Section, with the object of giving instruction in flying and in the technical side of aviation. Airplanes and certified instructors will be provided for a membership fee of 3 guineas ($15) a year, and instruction will be continued until the member qualifies for the aviator's certificate, which in turn qualifies him for the Air Ministry's license.

The Air Ministry's grant of £10 ($50) for each pilot qualifying will be paid to the members, and as this will cover the cost of the necessary licenses the member will be able to pass out as a fully qualified pilot and have the use of club airplanes for a total expenditure of not more than $25, including a year's membership in the club. Hitherto the cost of tuition in professional aviation schools has run to about $500.

The idea is to encourage the use of light airplanes, but the new pilots will get all the benefit of the training on heavier machines.

Unusual Gliding Record

Lieutenant Thoret, the French army aviator who specializes in long gliding flights, using regular airplanes with the motor stopped, on Jan. 24, at St. Remy-en-Provence beat his previous record for two-seater gliding by more than an hour when he remained aloft with a passenger 2 hr. 26 min. The propeller of Lieutenant Thoret's ship was locked and sealed before he took off.

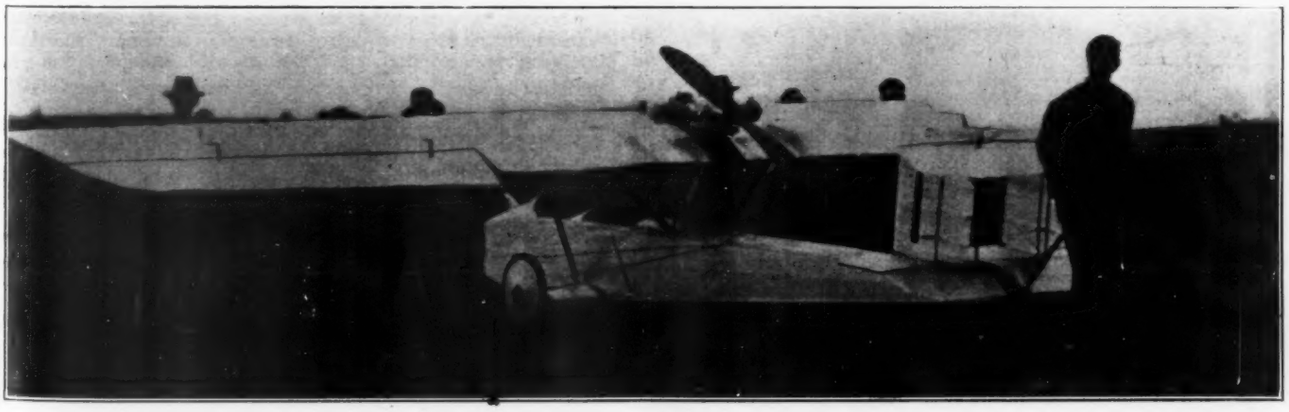


Photo International

Australian light plane, the Wackett "Warbler" two-seater, which successfully took part in the first Australian light plane competition, held last December at Richmond, New South Wales

AIRPORTS AND AIRWAYS

Pittsburgh News

By Ray A. Tucker

Recalling the old superstition of the Air Service, the Third Annual Military Ball of the Aero Club of Pittsburgh will be held this year on *Friday, the thirteenth of February,* at the William Penn Hotel. Capitalizing upon past experiences, this year's ball will be the most dashing social event of the season. Lieuts. "Les" Arnold and Leigh Wade, world-flight officers, have been extended an invitation to be present as guests of the Club, and to address on that same day, a combined luncheon of the Aero Club and the Chamber of Commerce.

C. Glenn Hunter is Chairman of the Ball Committee and is assisted by Joseph C. Wilson, Jr., Jos. M. Slater, Col. Harry C. Fry, Jr., John B. McCormick, Theodore Taney, J. Dalzell McKee, Harmer D. Denny, Jr., Col. William Thaw, Louis T. Barry, Howard B. Pearce, and Ray A. Tucker.

• • •

A very "live" Air Mail Committee has been appointed by the Chamber of Commerce of Pittsburgh to confer with Colonel Henderson, Second Assistant Postmaster General, in order to outline plans for putting Pittsburgh on a new aerial route to run from New York to New Orleans. This Committee which met Colonel Henderson last week, is composed of Chairman T. A. Dunn, Harry C. Fry, Jr., J. B. Fisher, C. H. Ogden, and Howard B. Pearce, president of the Aero Club of Pittsburgh. The Air Mail Committee of the Aero Club of Pittsburgh is assisting the Chamber of Commerce Committee by furnishing technical data.

• • •

Maj. Henry C. Pratt, Assistant to Maj. Gen. Mason M. Patrick, on Friday evening, Jan. 23, addressed the night students of Carnegie Institute of Technology on the subject of "Aircraft and National Defense" and during his address, illustrated with moving pictures, the latest types of fighting aircraft.

Ft. Worth News

The G. D. Arnold Aircraft Supply Co. of Ft. Worth, Tex., is very busy finishing a 5-place Standard plane for the Gates Flying Circus of New Orleans, La. The ship will be powered with a Model E, 180 hp. Hispano motor. This company also has under construction a 220 hp. Special Hispano-Standard with clipped wings. It is being constructed as nearly fireproof as possible. The propeller is a specially built Hartzell. The undercarriage is DH design and DH tail skid is used. It has an Orenco radiator with shutters.

Mr. Arnold has built and assembled 29 airplanes in the last two years. His is the only business of its kind in Fort Worth.

Pilot Ross Arnold and J. D. Bowie with two planes have gone to Navasota this week to do some "ad work."

Scintilla Magneto Adopted by Navy

The Bureau of Aeronautics, Navy Department, has just closed a contract with the Scintilla Magneto Co., of New York, for Scintilla 9 and 12 cylinder magnetos to replace present types now in service. The adoption of Scintilla as Naval Aviation equipment followed exhaustive laboratory and service tests which have shown that the life of the Scintilla magneto is approximately three times greater than the life of the engine before major overhaul is necessary.

The Scintilla magneto is a Swiss product which is now being manufactured under American management and capital at Sidney, N. Y. Laurence Wilder, president of the American company, is also American representative of Brown, Boveri & Co., of Switzerland, international manufacturers of electrical equipment with plants in twenty-seven countries. The announcement, made on Jan. 28, that Brown, Boveri & Co. had entered the American electrical field with an initial investment of between $35,000,000 and $40,000,000 is of interest to the aviation industry because the Swiss Scintilla company is a subsidiary of the Brown, Boveri interests and in consequence the American Scintilla Company is closely allied with the new American branch of Brown, Boveri & Co., general electrical apparatus manufacturers.

The aviation interests of the Scintilla Magneto Co., are in charge of Thos. Z. Fagan, manager, 225 West 57th St., New York.

As the Scintilla magneto operates on principles which are directly the reverse type of other forms of magneto ignition, readers of AVIATION and particularly pilots, will be interested in the technical description which will appear in an early issue.

Aeronautic Executives Revived

The Aeronautic Executives Association will resume their monthly meetings within the next few weeks, according to a statement issued by R. R. Blythe, chairman.

The monthly luncheons will continue to be held, as in the past, at the Café Boulevard, 41 steps off Broadway on 41st Street. At each meeting there will be present a prominent speaker on aeronautics of interest to all. Among those who have addressed the Aeronautic Executives in the past are: R. E. M. Cowie, President of the American Railway Express Co.; Congressman F. H. LaGuardia; Col. Paul Henderson, Assistant Postmaster General; Admiral W. F. Fullam; Grover C. Loening, of the Loening Aeronautical Engineering Corp., Col. Frank Searle of the Imperial Airways Ltd., of London, and many others.

The purpose of these gatherings is to promote good fellowship and understanding between the executives of the aircraft industry; to invite free discussion on aircraft topics and to aid in every way the development of commercial aviation. There are no dues and the membership is made up of aviation executives, engineers, designers, and businessmen who are interested in aeronautics.

Plane Hit Town Hall—Claim Compensation

The town of Eliot, Me., is seeking compensation from the Federal Government because an Army airplane recently crashed against the Town Hall and damaged it. Army headquarters at Boston just receievd from the War Department the claim sent to Washington. Major Stillwell of the Fifth Infantry stationed at Portland, Me., has been ordered to Eliot to investigate.

The accident in which the Town Hall was damaged occurred when an aviator, flying from Mineola Field, N. Y., to Boston, became lost in thick weather. Flying close to earth he struck the Eliot Town Hall. The plane was damaged, but the pilot escaped injury.

Aerosled with 80 hp. LeRhone engine, built by Harry Sensenich and brother of Lititz, Pa., which carries four persons at a speed of 100 mi./hr.

An Argentine Testimonial to Curtiss

The Curtiss Aeroplane Export Corp. of New York has just received a letter from the president of the Argentine Aero Club which constitutes a most unusual and highly flattering testimonal of this company's activities in the Argentine Republic.

It is not generally known that the Curtiss Aeroplane Export Corp. has, ever since 1919 fought single-handed the battle for the American aircraft manufacturer in South America while the French, English and Italian aircraft industries were supported there by official and semi-official missions sent out by their respective governments. In that year the Curtiss company established permanent airdromes and selling agencies in various countries in South America, as a result of which many pilots were trained and machines sold.

Among the organizations that thus came into being, one of the most active and successful is the one managed by Lawrence Leon at Buenos Aires, Argentine Republic. Mr. Leon and the Curtiss organization form the only independent and private aircraft enterprise which has remained permanently in that country. The manner in which the Argentine Aero Club, the governing body of aviation in that country appreciates Mr. Leon's activities is shown by the above-mentioned letter which follows.

AERO-CLUB ARGENTINO
Florida, 640
Buenos Aires, Dec. 16, 1924.

To the President of the
Curtiss Aeroplane Export Co.,
52 Vanderbilt Avenue,
New York City.

In order to fulfill a vote of the Executive Commission of the Argentinian Aero Club, which vote was taken after a motion made by the member Dr. Gonzalo Garcia, we take pleasure to advise you that the above mentioned Commission has seen with delight not only the work done by your representative Mr. Lawrence Leon, in the aeronautical tests which were organized by this institution within the sporting year of 1923, but the performances of the "Curtiss" aeroplanes which, at the big four events organized during said period, have been excellent.

Mr. Leon, indeed, entered in three of these events, where he carried out the first place in the first two of them, and, in spite of his disfavorable handicap, he finished the second in the other, just six seconds after the winner.

In the fourth test, the only machines which got through were also two "Curtiss" machines.

And that this be recorded, as a right stimulus for your concern as well as for your worthy representative in this City, to whom we mail a copy today of this document.

With greetings to your President, we are
Yours very truly,
(Signed) URBANO DUBOIS
President
RAMÒN HERRAN
Secretary

Franco-American Aviation Reunion

Under the auspices of the Aeronautic Committee, American Legion Post No. 1, Paris, France, a very successful Franco-American aviation reunion was held on Dec. 16, last, in the Salle des Ingénieurs Civils. Among the many prominent figures who honored the banquet with their presence were M. Laurent-Eynac, French Under-Secretary of State for Aeronautics; Commandant Brocard, former chief of the Escadrille des Cigognes; Major Walsh, American air attaché in Paris; General Dumesnil, director of the French army air service; General Niessel, inspector general of French military aviation; Count Henry de la Vaulx, president of the International Aeronautic Federation; Capt. René Fonck, president of the Aeronautic League of France; Col. Thomas W. Miller, newly elected president of the Inter-Allied Federation of Former Combatants; Col. and Mrs. Charles W. Westcott; Maj. Benjamin Conner; R. C. Wood, chairman of the Aeronautic Committee of the Paris American Legion Post; Commander Thorn; Dr. Edmond Gros; Major and Mrs. Kipling; Chaplain Beekman; Sydney B. Veit; Dr. Hifswell; etc.

Major Conner was the first to address the large assembly. He spoke very briefly of the early days of the war, after which he introduced the other speakers of the evening.

A most interesting talk was given by Captain Fonck, French ace of aces, who recounted some of his thrilling combats during the war.

Major Walsh next read a message from Ambassador Myron T. Herrick, who was unable to attend in person the reunion.

Major Brocard, commander of the famous French "Stork Squadron," gave an interesting account of the early days of the Lafayette Escadrille, ending with a glowing tribute to the American aviators.

He confirmed the announcement made public some time ago that Clifford B. Harman, a veteran American balloonist and aviator, has offered two aviation trophies—one to be known as the "Lafayette Escadrille Trophy" and the other as the "Clifford B. Harmon Trophy."

The organization and development of the Lafayette Escadrille, together with some of the difficulties encountered, were the subject of Dr. Edmond Gros' address. Dr. Gros, who was first a surgeon in the American Ambulance corps and then closely associated with the Lafayette Escadrille, told how, before America entered the war, Germany objected to the American unit fighting with the Allies bearing the official title of "American Escadrille." Whereupon the name was changed to Lafayette Escadrille.

Colonel Miller was the last speaker. He spoke of the importance of the Legion post in France, which post he described as "the rear guard of the war."

After the meeting an interesting motion picture on aviation was shown. The film was lent by the French Air Minister.

French Rivalry for Speed Record

Intense rivalry has resulted between the Ferbois and the Nieuport companies of France as the result of the former recapturing the straightaway speed record from America. M. Bonnet, the victorious Ferbois pilot, stated in *L'Auto* of Paris that he expected to raise his own record to 500 km./hr. (310 mi./hr.) as soon as his Ferbois racer will have undergone a few changes. The 600 hp. Hispano-Suiza engine is to be boosted up to 750 hp., and eclipse (retractible) radiators will be fitted. The landing gear will be dropped in flight and instead the machine will land on skis. Bonnet was of the opinion that at the "reduced" landing speed of 90 mi./hr. the machine might possibly crash, but he thought that a world's record was worth risking a crash.

In the meantime Sadi Lecointe, who was the world's recognized speed king until the Maughan-Mitchell-Brow-Williams avalanche of speed records deprived him of that position, has gone to Istres, near Marseille, to attempt setting new world's records on the Nieuport racer of the last Beaumont Cup. He will first test the efficiency of different propellers, and with the best on hand he will go out for the 100, 200, 500 and 1000 kilometer speed records.

Riffians Shoot Down Spanish Planes

Several Spanish military planes were recently shot down in Northern Morocco by the Riffians, the warlike mountaineers who are in revolt against the Spanish rule. Among the reinforcements the dissident tribes near Tangier recently received from Abdel Krim, the Riffian leader, were contingents of expert snipers, equipped with modern rifles, and it is to their activity that these Spanish losses are attributed. As a reprisal Spanish airmen concentrated their bombardment on a village where the snipers were stationed.

Exports of Aircraft from France on Increase

Imports of aircrafts during first nine months of 1924 amounted to 4.6 metric tons as compared with 1732.1 metric tons during the same period of 1923, Vice Consul Wm. Clarke Vyse, Paris, reports to the Department of Commerce.

Exports amounted to 924.8 metric tons valued at 27,690,000 francs for the January to September period of 1924 as compared with 715.4 metric tons valued at 19,212,000 francs for the same period in 1923.

UNITED STATES AIR FORCES

U. S. ARMY AIR SERVICE

Douglas Wins Observation Plane Competition

As a result of the Observation Plane Competition held by the A.S. Engineering Division last fall at McCook Field, the Douglas entry, type XO2, with Liberty XII engine has been adopted as the new standard observation plane of the Army Air Service in place of the war-time DH4. An order for fifty ships of this type has been awarded the Douglas Co. of Santa Monica, Calif.

As will be seen from the accompanying illustration, the new observation plane is a single bay tractor of simple and rugged construction which has a great deal of resemblance with the World Cruiser type. The wings are of wood construction, while the fuselage is made of welded steel tubing, braced with tierods. The wings and the fuselage are both fabric covered, except around the engine section which is covered with sheet aluminum. The engine section is quickly demountable by the removal of four bolts, as was the case of the Douglas World Cruiser.

For the time being the Air Service has not released any detailed information on this ship nor on any of the other new airplanes built for the competition. It is confidently expected that this information will become available before long.

Army Air Orders

First Lieut. Bob E. Nowland, A.S., Marshall Field, to Bolling Field.

Capt. Charles B. Oldfield, A.S., Org. Res., Muskogee, to Brooks Field.

Sec. Lieut. James T. Cumberpatch, A.S., Brooks Field, to San Francisco, sailing on transport April 14 to Canal Zone.

Sec. Lieut. Haynie McCormick, A.S., promoted to grade of First Lieutenant.

Spec. Or. 303, assigning Warrant Off. Harrison Billingsley, A.S., to Mitchel Field, made effective upon completion of foreign service.

Spec. Or. 303, relieving Warrant Off. Corbett Carmichael, A.S., from duty Scott Field, and assigning him to France Field, revoked.

First Lieut. Junius A. Smith, A.S., Langley Field, to Brooks Field.

First Lieut. James D. Givens, A.S., Chanute Field, to New York City, sailing March 4 via Government transportation for Hawaiian Islands.

Capt. Otto G. Trunk, A.S., Atlanta, to Bolling Field.

First Lieut. Lowell Herbert Smith, A.S., promoted to grade of Captain.

Maj. Shepler W. Fitzgerald, A.S., Kelly Field, to Ch. A.S., Washington.

First Lieut. Charles W. Steinmetz, A.S., Bolling Field, to Ch. A.S., Washington.

Maj. Douglas B. Netherwood, A.S., New York City, to Washington.

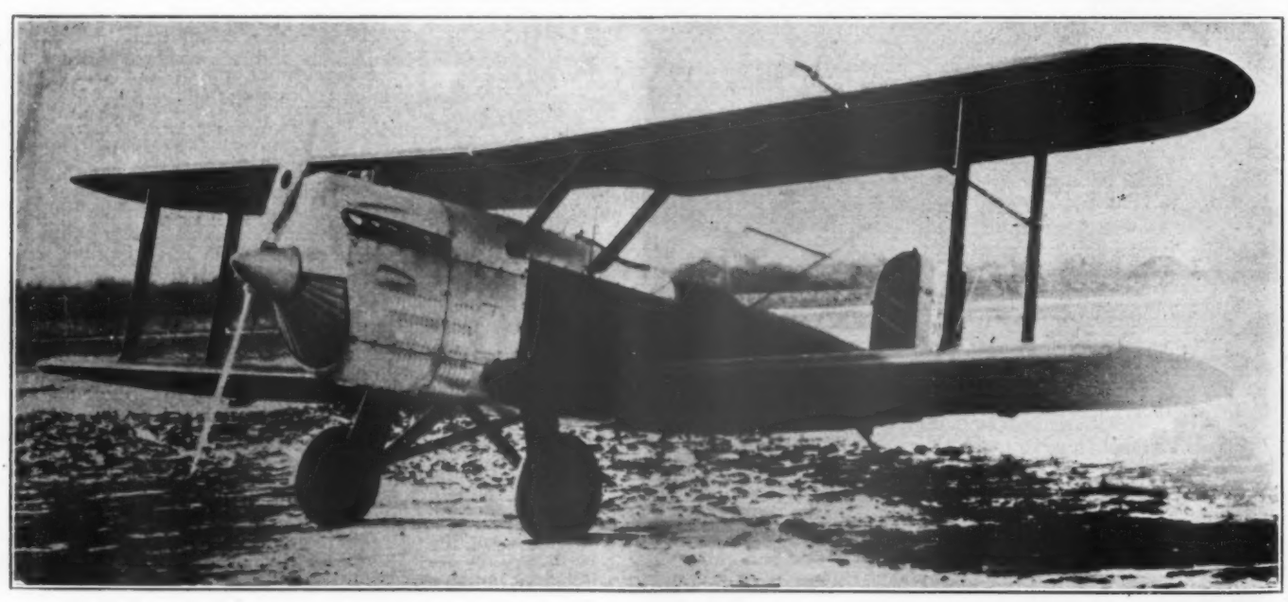
Maj. Norman W. Peck, A.S., Akron, to Scott Field.

Hawaii's Need for Landing Fields

Hilo's need of an airplane landing field was brought home more keenly than ever when Lieut. Joseph A. Wilson of the 4th Observation Squadron, Wheeler Field, Oahu, T. H., recently circled over the city, dropped a message, and returned to Parker Ranch where two planes had landed earlier in the day. Lieutenant Wilson's message read:

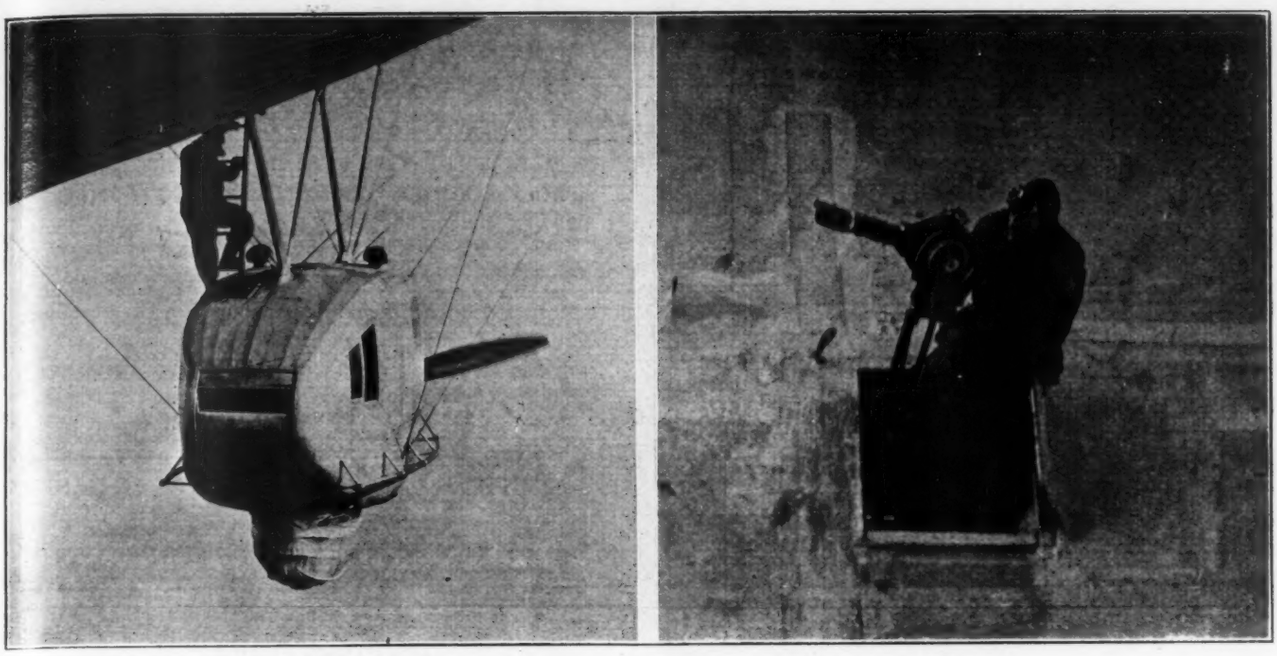
"We would like to drop in and see you this morning if you only had a landing field. Air Service unit, Wheeler Field, is visiting Parker Ranch. Kohala is condemning 12 acres of cane field for a landing field."

Immediately upon receipt of the message, Dr. Milton Rice, President of the Chamber of Commerce of Hilo, wrote a letter to Lieutenant Wilson acknowledging receipt of the message and assuring him that the Chamber is doing everything in its power to provide for just such occasions as this. The land is already selected, said Dr. Rice, and while it will cost considerable money to put it into shape it is the hope of the Chamber that everything will be in readiness shortly after the first of the year.



P. & A. Photo

The Douglas XO2 observation plane (Liberty XII engine) which has been adopted by the Army Air Service to replace the war-time DH4 as a result of the competition held at McCook Field



Official Photo, U. S. Navy

Privileged "seats" on the airship Los Angeles to watch the sun's eclipse—Left, Lieut. W. L. Richardson, in charge of Naval Aviation photography, on one of the power cars; right, A. K. Peterson, chief photographer the Navy, making a motion picture record from the top of the ship

Airship TC4 Rolls Up Big Flying Time

During the second week in December the Airship TC4 at Langley Field, Va., flew four out of the five working days, twenty-nine flights being made. Col. I. F. Fravel of the Office of the Chief of Air Service came to Langley Field on Dec. 15 and made nine flights, piloting the TC4. On other flights officers of the Heavier-than-Air branch were taken up as passengers.

U. S. NAVAL AVIATION

Naval Air Orders

Lt. (jg) Myron F. Eddy, det. Nav. Air Sta., Pensacola, Fla.; to Aircraft Squadrons, Setg. Flt. involving flying.

Lt. (jg) John M. Hoskins, det. U.S.S. Maury; to temp. duty under instr. in aviation, Naval Air Sta., Pensacola, Fla.

Lt. (jg) Joseph C. Van Cleve, det. Edgewood Arsenla, Edgewood, Md.; to temp. duty under instr. in aviation, Naval Air Station, Pensacola, Fla.

Ens. Edgar A. Cruise, det. U.S.S. West Virginia; to temp. duty under instr. in aviation, Naval Air Station, Pensacola, Fla.

Ens. Roy R. Darron, det. Div. 35, Dest. Sqd., Battle Flt.; to temp. duty Naval Air Station, Pensacola, Fla.

Ens. Thomas H. Ochiltree, det. U.S.S. California; to temp. duty under instr. in aviation, Naval Air Station, Pensacola, Fla.

Lt. (jg) Bernard J. Skahill, det. U.S.S. S-15; to temp. duty under instr. in aviation, Naval Air Station, Pensacola, Fla.

Ens. Frank Akers, det. U.S.S. Sumner; to temp. duty under instr. in aviation, Naval Air Sta., Pensacola, Fla.

Ens. Vernon O. Clapp, det. U.S.S. Arizona; to temp. duty under instr. in aviation, Naval Air Sta., Pensacola, Fla.

Ens. Michael J. Malanaphy, det. U.S.S. Maryland; to instr. in aviation, Naval Air Station, Pensacola, Fla.

Ens. John L. Pratt, det. Dest. Squad., Setg. Flt.; to temp. duty under instr. in aviation, Naval Air Station, Pensacola, Fla.

Ens. William B. Tucker, det. U.S.S. Maryland; to temp. duty under instr. in aviation, Naval Air Station, Pensacola, Fla.

Lt. (jg) John W. Harris, det. U.S.S. Sloat; to temp. duty under instr. in aviation, Naval Air Station, Pensacola, Fla.

Lt. (jg) Robert C. Warrack, det. U.S.S. Tennessee; to temp. duty under instr. in aviation, Naval Air Station, Pensacola, Fla.

Ens. Matthew S. Q. Weiser, det. Nav. Torp. Sta., Newport, R. I.; to temp. duty under instr. in aviation, Naval Air Station, Pensacola, Fla.

Lieut. John Law, det. U.S.S. Patoka; to temp. duty, Edgewood Arsenal, Edgewood, Md.

Ens. Henry F. MacComsey, det. U.S.S. California; to temp. duty under instr. in aviation, Naval Air Station, Pensacola, Fla.

Ens. Herbert E. Regan, det. U.S.S. California; to temp. duty under instr. in aviation, Nav. Air Sta., Pensacola, Fla.

Lt. Comdr. William W. Hargrave (MC) ors. Dec. 6, 1924, modified. Det. Dec. 23, 1924, Nav. Air Sta., Lakehurst, N. J., and carry out remainder orders.

Lieut. George W. Davis (SC), det. Aircraft Squads., Battle Flt.; to such duty Nav. Air Sta., San Diego, Calif.

Lt. Comdr. Maurice R. Pierce, Lieut. Joseph C. Arnold, Lieut. Clinton H. Havill, Lieut. Raymond F. Tyler, Lieut. Herbert V. Wiley, Lieut. William Nelson (SC), det. Nav. Air Sta., Lakehurst, N. J.; to U.S.S. Los Angeles.

Lt. (jg) Paul E. Howard, det. U.S.S. Pensacola; to temp. duty under instr. in aviation, Nav. Air Sta., Pensacola, Fla.

Lt. (jg) David A. Hughes, det. Rec. Ship, San. Fran. Calif.; to temp duty under instr. in aviation, Nav. Air Sta., Pensacola, Fla.

Lieut. Steward S. Reynolds, det. U.S.S. Rainbow; to Naval Air Sta., San Diego, Calif.

Lieut. Herbert S. Woodman, det. Aircraft Squads. Battle Flt.; to Nav. Air Sta., Pearl Harbor, T. H.

Lt. (jg) Cato D. Glover, Lt. (jg) Dorris D. Gurley, det. Aircraft Squads. Setng. Flt.; to Nav. Air Sta., Pearl Harbor, T. H.

Lt. (jg) Edmund T. Steward (SC), to duty Nav. Air Sta., Lakehurst, N. J.

Bosn. George F. Kahle, det. U.S.S. Langley; to VS Squad. Two.

Capt. George W. Steele, det. Bu. of Aero., Navy Dept.; to command Naval Air Sta., Lakehurst, N. J.

Comdr. Jacob H. Klein, Jr., det. command Nav. Air Sta., Lakehurst, N. J., to executive officer, Nav. Air Sta., Lakehurst, N. J.

Where to Fly

CALIFORNIA
THE RYAN SCHOOL OF AVIATION
O. B. STAR ROUTE SAN DIEGO
Ideal flying weather all Seasons. Very best of planes and instructors. Opportunity to study latest planes and construction.
A few recommended students will be given employment in our shops, while learning to fly.

CALIFORNIA
VARNEY FLYING SCHOOL
Established since 1914
SAN MATEO SAN FRANCISCO

ILLINOIS
HEATH AIRPLANE COMPANY, Inc.
Oldest aeronautic establishment in U. S.
Airplane Supplies Flying School
2856 Broadway Chicago

ILLINOIS
PARTRIDGE, Inc.
Aeronautical Instruction
Aero Club of Illinois Mail Address--
Field. Chicago, Ill. *Write for Booklet* 430 S. Michigan Ave.

ILLINOIS **FLY THEM YOURSELF**
Flying instructions by the hour. Ex Air Mail Pilots as instructors. All size ships and motors. All year flying.
YACKEY AIRCRAFT COMPANY
Flying Field, Checkerboard Field, Maywood, Illinois
Telephone Maywood 1963 (Suburb of Chicago)

ILLINOIS
MID-WEST AIRWAYS CORP.
MONMOUTH, ILL.
One of the four best fields in America
Thorough Flying Instruction Course by experts at lowest rate.
Passenger Flights to Points Near or Far

KANSAS **AVIATION ENGINEERING CO.**
Single and 2 Seater
LIGHT PLANES
Parts, Instruction, Blueprints $2-$5, Propellors $10.
Circular Free LAWRENCE, KANSAS

MARYLAND
THE SKYSYNE CORPORATION
NIGHT & DAY AERIAL ADVERTISING
OFFICE *Get our prices FIRST* AIRDROME
711 Keyser Bldg. 3 Planes at your Logan Field
Baltimore order Dundalk, Md.

MICHIGAN **BURNS--FLYERS**
SCHOOL OF COMMERCIAL AVIATION
Get started now in this promising and fascinating new industry.
814 East Main Street LANSING, MICH.

MISSOURI
NICHOLAS-BEASLEY AIRPLANE CO. Complete flying instructions, by hour or by complete course, primary, cross country, advance training, solo. New ships and new motors. Instructors who take an interest in you. No deposit required on solo flight. Write for full particulars. MARSHALL, MISSOURI.

MISSOURI
ROBERTSON AIRCRAFT CORPORATION
Airplanes, Motors, Parts, Supplies; Shops and Hangars
ST. LOUIS FLYING FIELD
ANGLUM, MO.

NEW JERSEY
CHAMBERLIN-ROWE AIRCRAFT CORP.
Aerial Advertising, Photography, Passenger Carrying, and Flight Training
New York Air Terminal Hasbrouck Heights, N. J.

NEW YORK
CURTISS EXHIBITION COMPANY, GARDEN CITY, N. Y.
Flying Fields—Garden City, Buffalo, N. Y.; Dallas, Tex.; Miami, Fla. Complete flying service including schools, aerial photography, passenger and fast cross country transportation to any point. Air fleet of thirty machines.
Big reduction in rates for flying instruction. Write for information.

NEW YORK
PORT WASHINGTON, LONG ISLAND
FLYING BOAT SCHOOL Clifford Webster—Instructor
Winter Station Jan. 1-May 1 Palm Beach, Fla.
Curtiss Metropolitan Airplane Co., Inc.

OHIO **AKRON-CLEVELAND**
Flying School for students in Aviation. "Pay as you Learn."
Modern WACO Plane with high-lift wings.
Passenger Rides **STOW AVIATION FIELD** Hangars
Advertising Stop 53 Akron-Kent-Ravenna Supplies
Photography Car line, 6 mi. northeast
Rt. 1, Cuyahoga Falls, Ohio. of Akron.

OHIO
DAYTON, OHIO
Supplies, Hangars, Shops and Field 1 Mile from Dayton limits.
JOHNSON AIRPLANE & SUPPLY CO.

PENNSYLVANIA
ESSINGTON SCHOOL OF AVIATION
Established 1915 Frank Mills, pilot
FLYING BOATS, SEAPLANES, AND SPARES
ESSINGTON (just west of Philadelphia), PA.

PENNSYLVANIA
CAN YOU FLY
If you can't and want to learn, write us. We have an opportunity for you which you can't afford to pass up. Write today.
GREAT LAKES AIRWAYS INC. ERIE, PENNA.
Complete Aero Service:—Parts and supplies of all kinds. Get our prices first—24 hour service.

PENNSYLVANIA
PITCAIRN AVIATION
LAND TITLE BUILDING PHILADELPHIA
FLYING FIELD AT BRYN ATHYN PENNSYLVANIA
COMMERCIAL FLYING INSTRUCTIONS SHORT FLIGHTS

TEXAS Year-roundFlying
SAN ANTONIO AVIATION & MOTOR SCHOOL
Expert instruction in flying and mechanics
Free sleeping quarters at Airdrome
AIRPLANES, ENGINES, PARTS, SUPPLIES, SHOPS, HANGARS, OX5s, Hissos, Liberties, Jennies, Canucks, Standards
Large stocks on hand, prompt shipment, best values
Office 509 Navarro Street San Antonio, Texas

If your company is giving first class flying instruction you should be represented in

WHERE TO FLY

to keep your name and facilities regularly before those you want to enter this field.

The WHERE TO FLY Directory is backed by our cooperation and service.

WRITE FOR INFORMATION

Publisher's News Letter

The subject of an Independent Air Force has been the battleground in Washington ever since the Curry Bill was introduced. The Hearings are bringing out all the different points of view. General Mitchell, whose outspoken claims for aviation have always kept him in hot water, has given his views with complete frankness both to the Committees and to the public in a series of articles in *The Saturday Evening Post*. He, also, has once more led in the attack on the battleship. His statements have brought down on him the wrath of the Navy from Secretary Wilbur down to the flying officers. It reminds us of the time when General Mitchell was laughed at by Secretary Daniels and his official advisers before the sinking of the ex-German warships off Cape Hatteras.

* * * *

General Mitchell's detail as Assistant Chief of Air Service expires in March and perhaps this attack on him is timed with the reappointment in mind. Not to continue him in his present position would not only deprive airmen of a bold and fearless spokesman, but what is infinitely more important, it would give the impression that an officer who gives his honest opinions openly and convincingly is not wanted around Washington. Whatever may be said of an officer's ability in other directions, the one quality that should be encouraged is freedom of speech. Admiral Sims is an excellent example of the salutary effect such freedom of expression brings to any service. Were Congress to be in session when General Mitchell's reappointment is to be decided upon, the principle of free speech might not be subordinated, but as Congress will have adjourned by then, the matter will rest entirely with the Secretary of War. Those who believe in permitting an officer to have the greatest freedom of expression as far as it is compatible with discipline should give the War Department the benefit of their views by writing to Secretary Weeks or even to the President.

* * * *

Among the very interesting testimony on the Curry Bill is the statement of Admiral Strauss in which he states that "An airplane carrier ready for war costs more than any battleship afloat and air war is the most expensive of all." Estimating the cost of the aircraft carriers Saratoga and Lexington at $41,000,000 each, Admiral Strauss apparently confuses the cost of *air war* with the cost of *aircraft protection of a fleet*, for that is all that aircraft carriers can hope to do. Only by stretching the facts can aircraft carriers be considered as of value in attacking land or air forces. If Admiral Strauss had said that the aerial defense of a fleet was expensive, we would have heartily agreed with him, but for him to charge to the air defense of the country the cost of aircraft carriers is diametrically opposed to the statements of Admiral Moffett before the Appropriations Committee last year. Under the present system aviation is costing the government large sums. If the cost of aircraft carriers is added it will be well over $100,000,000 a year. Statements like those of Admiral Strauss only make the elimination of duplication, overheads and decentralization more important.

* * * *

So that our readers may know that the Secretary of War has recognized the impropriety of officers on active duty conducting a publication in the aeronautical field which is not a "service" magazine, the following announcement by the Army and Navy Air Service Association will again justify the stand AVIATION has taken regarding such unfair competition.

The announcement reads: "Inasmuch as mandatory instructions have issued from the Secretary of War to the Chief of Air Service that officers on active duty be removed from the management of the Air Service Publishing Co., Inc., the Board of Control, in conformity with what it believes to be the wishes of the Chief of Air Service, has decided to place before the members of the Association the question as to whether the Association shall relinquish all stock in *U. S. Air Services*, heretofore designated the official publication of the Army and Navy Air Service Association, by the sale of the stock which it owns in the Air Service Publishing Co., Inc."

The action proposed is what should have been done without orders from the Secretary of War, but coming as it does after a careful investigation by the Inspector General and recommendations by the Judge Advocate General, the broad principle of publishing activities of Government departments will have been clearly defined. AVIATION has not been alone in its concern in this decision. The National Publishers Association has also watched the case and its developments with great interest. Fortunately, this important group of publishers will follow the action of the officials in their solution of this publishing problem. They will be equally interested in learning whether or not officials of any Government department can solicit advertising, provide editorial material and secure subscriptions for a publication in which they have a financial interest, and whether, after their efforts have built up a property, they can sell it with the "good will" thus created.

Or readers may take little interest at first thought in these publishing details. However, when they know that a relief from this official competition will enable AVIATION to become a larger and better publication, they will share our feeling of satisfaction that at last a fair and open field will be available to all aeronautical publications.—L.D.G.

THE Aircraft Service Directory

WHERE TO PROCURE EQUIPMENT AND SERVICES

POWER FUEL PUMP

PIONEER INSTRUMENT COMPANY
MAIN OFFICE AND FACTORY BROOKLYN NEW YORK
WASHINGTON 441 STAR BUILDING
PARIS 97 BOULEVARD SAINT MICHEL
SAN FRANCISCO 15 SPEAR STREET

TRADE HAMILTON MARK
PROPELLERS

AVIATION STUDENT COURSES
Supervising $125.00; airplane construction $50.00; airplane motor experts $40.00; all manual training and practical $5.00 down payment and $5.00 per week. Factory, school, 3 flying fields, seven instructors. Finest aviation school in America. Also airplane and parts service.
OVERCASHIER AVIATION CO.
25 Cottage Grove Ave. Highland Park, Michigan

LUDINGTON EXHIBITION COMPANY
Sport Farman Ships
Aerial Taxi Service
Exhibition Flying
Office: 810 Atlantic Bldg. PHILADELPHIA
Flying from Pine Valley, N. J. PINE VALLEY, N. J.

—PETREL MODEL FIVE—
—Super-Performance In the 3 Seater Class—
—Seaplane or Landplane to Suit Your desires—
—Air Cooled or Water Cooled Motors—
Details on Models Four & Five gladly furnished on request
HUFF DALAND AERO CORPORATION
OGDENSBURG, N. Y.

NEW YORK UNIVERSITY
Courses in Aeronautical Engineering and Industrial Aviation
For catalog apply to
The Dean, College of Engineering, New York University, University Heights, New York City

1 New 5 Place 220 H.P. Hisso Standard ....$1100.
1 New 3 place OX5 Curtiss Standard with nose radiator ..$ 700.
1 Overhauled and recovered 150 H.P. Hisso Standard ....$1000.
1 Slightly used Hisso Jenny .....$1000.
1 Slightly used JN4D .....$ 500.
2 New Curtiss JN4D's Flown from Dallas, Tex. Here each .$ 700.
1 T.M. Scout with OX5 motor .....$ 800.
WE.....BUY.....SELL.....OR.....TRADE
J. Warren Smith, 182 North Sandusky St., Delaware, Ohio

PAUL G. ZIMMERMANN
DESIGNER AND CONSTRUCTOR
OF
METAL AIRCRAFT
113 MAIN STREET, KEYPORT, N. J.
Telephone, Keyport 150.

WE MAKE A SPECIALTY OF
Curtiss Airplanes, Motors and Parts
You will find that our goods are reliable and our prices right.
G. S. IRELAND, CURTISS FLYING FIELD GARDEN CITY, N. Y.

San Antonio Airways, Inc. Changes Name to SOUTHERN AIRWAYS, Inc.
Our business has grown to such an extent that we are forced to open branches at Houston and Little Rock in addition to our present Flying Fields at Dallas and San Antonio. We are prepared to serve every need of the civilian aviator at either field. We have the choicest selection of JN4s, Standards and TMs on the American market, also all kinds parts and supplies.
Main Office: 509 Navarro St., San Antonio, Tex.
Branch Office: Love Field, Dallas, Tex.

OX5 STANDARDS — $625.00
READY FOR DELIVERY: ASSEMBLED & TEST-FLOWN
STANDARD J-1 WINGS, CURTISS & LAWRENCE ENGINES;
COMPLETE STOCK OX5 PARTS, RADIATORS & ACCESSORIES
— *WRITE FOR PRICE LISTS* —
TIPS & SMITH
P. O. Box 153 (1505 Washington Ave.) HOUSTON, TEXAS

PARAGON PROPELLERS
BETTER THAN EVER
Paragon Engineers, Inc.
Baltimore, Maryland

EDWARD P. WARNER
Consultant in Aeronautical Engineering
and
Commercial Operation of Aircraft.
Mass. Institute of Technology
Cambridge, Mass.

SEND ONE DOLLAR
Actual Size
We will send you by return mail a beautiful pair of sterling silver wings mounted on bar pin with safety catch. also identification card issued by National Flyers Ass'n. These pins are being worn by thousands of aviators, aviation mechanics and boosters.
WALLACE AERO CO., Bettendorf, Iowa

AIRCRAFT SERVICE DIRECTORY
CONTINUED

BELLANCA

6 Seater with 90 hp. OX5
8 Seater with Hispano

COLUMBIA AIRCRAFT CORPORATION
BOX 17, HASBROUCK HEIGHTS, N. J.

Army Surplus Airplanes and Supplies

Standard J1—OX5, OXX6, and Hispano 150 motored, $750. Curtiss JN4D—OX5 motored, new and used, $400. Avro and Thomas Morse Scouts, new and used.

Motors, Hispano 150, Hispano 220, Curtiss OX5 and OXX6. Wings, single or sets—Standard, Curtiss JN4, or Canuck. Special bargain tail units; Curtiss JN4 and Canuck rudders, $4. Propellers, parts, dope, linen, tires, wheels, tubes—immediate shipment. Resistal goggles, $3; special price larger orders.

Price List on Request

Marvin A. Northrop, 200 Builders Exchange, Minneapolis, Minn.

WRITE FOR PRICES ON COMPLETE UNITS OR PARTS FOR
CANUCK and JN planes
HS2L flying boats
OX5, OXX6 and Liberty motors

ERICSON AIRCRAFT LIMITED
120 KING ST. E. TORONTO, CANADA

The Highest Grade of New Flying Boats of HS2L Type on the Market

with or without power plant, completely assembled ready for flight, or packed in boxes ready for shipment, at our Baltimore warehouse—Guaranteed 100% Complete—For purchaser of unassembled boats, liberal space for assembly will be allowed free of charge.

Terms can be arranged. *Aircraft Material of all Descriptions.*

COME DOWN AND LOOK OVER OUR STOCK

Box 831 F. G. ERICSON Baltimore, Md.

LIBERTY "12" AVIATION ENGINE PARTS

ASSEMBLIES, SPECIAL EQUIPMENT AND TOOLS ARE CARRIED IN OUR STOCK ROOMS FOR IMMEDIATE DELIVERY

JOHNSON MOTOR PRODUCTS INC.
518-522 WEST 57TH STREET NEW YORK, N. Y., U. S. A.

MATTHEW B. SELLERS
Consulting Aeronautical Engineer
Ardsley-on-Hudson, N. Y.

Harold Evans Hartney
Aviation Scientist and Consultant
(President, Yellow Aircab Company of America)
528 Transportation Bldg., Washington, D. C.

FIVE PASSENGER BREGUETS

With Renault or Liberty Motors. Landing speed 32 miles per hour; high speed 118; useful load 1250 lbs.; ceiling with load, 22,000 ft.; gas consumption, 15 gallons per hr. high lift wings; duraluminum construction throughout. Best performing ship ever known. Prices $3,800.00 to $6,250.00. Extra motor and parts.

YACKEY AIRCRAFT CO.
810-818 Desplaines Avenue
FOREST PARK, ILLINOIS (Suburb of Chicago)

CLASSIFIED ADVERTISING

10 Cents a word, minimum charge $2.50, payable in advance. Address replies to box numbers, care AVIATION, 225 Fourth Ave., New York.

WANTED—Immediately. Laird Swallow or Waco condition no object if priced right. Also Standard fuselage and new OX5. H. H. Emrick, 10 Neal Ave., Dayton, Ohio.

Brand new built hull and all surface frames, including struts. Controls built but not installed. Kelly built Curtiss F Boat with all M.F. features. Construction to date cost $3,000. Plane to be sold for debts, $250. the lot. Coates, 11 Third Ave., Bay Shore, L. I., N. Y.

FOR SALE: JN4D in wonderful condition. Never cracked, motor turning 1400 on the ground, a real bargain if sold at once. Chas. B. Gehring, 2570 South High St., Columbus, Ohio.

Do you want to learn to fly? Write for our catalog and details of a special opportunity. We also have home study courses. Varney Aircraft Co., Peoria, Illinois.

AIRPLANE TAPE—1" wide, white, 36 yd. roll lengths, at attractive prices. Purchased from Philadelphia Naval Aircraft Factory. Wire or write Supreme Supplies Co., 150 Nassau St., New York. Phone Beekman 7280.

FOR SALE: Aeromarine motors type D-6 and D-8 new complete with tools and spares. Fine jobs at very low prices. Lee Templeton, 407 W. Main St., Norristown, Pa.

FOR SALE: OX5 Canuck, engine good, upper wings poor, otherwise fair, $300.00 f.o.b., Pine Valley, N. J. Ludington Exhibition Co., Inc., 810 Atlantic Building, Philadelphia, Pa.

THE LONG ARM OF ADVERTISING

"WE ARE GLAD TO TELL YOU THAT WE HAVE HAD SPLENDID RESULTS FROM OUR ADS IN AVIATION. WE ALSO WANT TO THANK YOU FOR YOUR PROMPT AND CAREFUL ATTENTION IN THE PAST TO OUR ADS."

This from a dealer in aviation material and supplies in *California* whose regular classified advertisements in AVIATION (*published in New York*) extends his market to the entire United States. The continued growth of *AVIATION* Classified and Aircraft Service Directory advertising is the real index to the growth of commercial aviation in the U. S.

AVIATION ADS will do the same for you
Write for Information

Airplane Fabric and Covers

A Reminder to Look at Your Wing Covering

COTTON AND LINEN FABRICS AND TAPE—MADE UP COVERS. THREAD, TWINE, DOPE, PAINT AND VARNISH. NEW MATERIAL AND FRESH STOCK.

Mercerized Cotton Fabric,
36″ wide, $.65 yd. bolts of 60 to 70 yds. $.55 per yd.
English Linen Fabric,
36″ wide, $.90 yd. bolts of 70 to 80 yds. $.75 "
Cotton Pinked tape 2¼″ wide $.06 yd. rolls of 250 yds. $.04 "
Cotton Pinked tape 1″ wide $.03 yd. rolls of 250 yds. $.02 "
Linen Frayed tape 2¼″ wide $.08 yd. rolls of 75 yds. $.05 "
White cotton herring bone tape,
1″ wide $.02 yd. rolls of 75 yds. $.01 "
Flax twine No. 8 Cord Barbours or Andover per lb. spool $2.50 ea.
Double pointed needles .....10″ long or curved needles $.50 "

MADE UP COVERS *ready to put on*

Upper wing covers Jenny or Canuck mer. cotton or linen $16.80 "
Lower wing covers Jenny or Canuck mer. cotton or linen $15.00 "
Fuselage covers ...Jenny or Canuck mer. cotton or linen $16.80 "
Elevator covers Jenny, Canuck or Standard cotton or linen $4.00 "
Rudder covers .Jenny, Canuck or Standard cotton or linen $4.50 "
Upper wing covers for Standard J-1 .....cotton $18.50 "
Lower wing covers for Standard J-1 .....cotton $17.50 "

WE HAVE ALL OTHER COVERS IN STOCK OR CAN MAKE THEM UP FOR OTHER SHIPS AT SHORT NOTICE.

WRITE FOR OUR NEW CATALOG.

JOHNSON AIRPLANE & SUPPLY CO.

DAYTON, OHIO

LIBERTY & LE RHONE

Airplane Engines

TO BE SOLD FEBRUARY 25

AIR SERVICE ENGINES

The Air Service has released for sale another lot of aeronautical engines which should prove a very attractive offering to purchasers of these types of engines. Included in this lot are 734 Le Rhone 120 H.P. Rotary engines and 100 Liberty 12 Engines of 400 H.P. They are to be sold by sealed bids to be opened in the War Claims and Material Disposal Section, Office of The Chief of Air Service, Munitions Building, Washington, D. C. on February 25, 1925, at 2:00 P. M.

All of these engines have been used, but are repairable, and in instances where not completely assembled, parts will be supplied to make them substantially as complete as when received from manufacturers. Quantities of spare parts for the Le Rhone Motors are on hand and will be included without extra charge to purchasers of all or practically all of this type engine. Inspection may be made and is urged upon all interested.

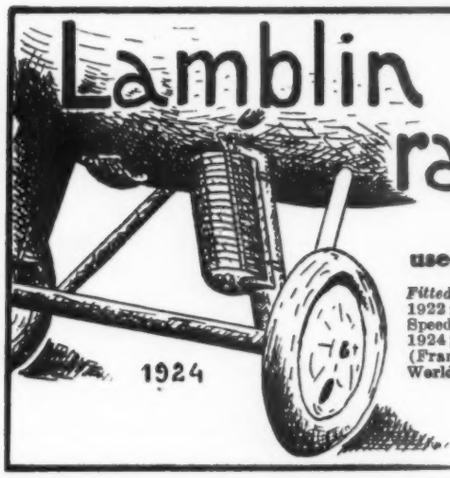
Bids will be received for one or any number of these. Circular proposals giving complete information are available. Wire or write for your copy to

WAR CLAIMS & MATERIAL DISPOSAL SECTION
Office of the Chief of Air Service
Room 2613 Munitions Building Washington, D. C.

The Government reserves the right to reject any or all bids.

WAR DEPARTMENT

Lamblin radiators



1922

used all over the world **on more than 10,000 aircraft**

Fitted to the winners of the following events: Gordon Bennett Cup; Deutsch Cup, 1920, 1921, 1922; Pulitzer Trophy, 1921; Circuit of Brescia; London Aerial Derby, 1922, 1923; the British Speed Record; Grand Cup of Italy, 1921, 1922; Lamblin Cup, 1923, 1924; Zenith Cup, 1923, 1924; Olympic Games Cup, Antwerp; Morane Challenge; Grand Prize of the Aero Club de l'Ouest (France); Grand Prize for Transport Planes (France), 1923, 1924; World Duration Record; World Speed over Distance Records (Airplanes and Seaplanes); World Altitude Record.

For particulars apply to

ETABLISSEMENTS LAMBLIN 36, BOULEVARD BOURDON, NEUILLY-SUR-SEINE, FRANCE

Loening Aeronautical Engineering Corporation

31st Street and East River, New York City

ORIGINATORS OF AIRPLANES OF ADVANCED DESIGN

Contractors to:

Air Service, U. S. Army; Bureau of Aeronautics, U. S. Navy;
Air Mail Service, U. S. Post Office Department

YOU NEED THESE AERONAUTICAL BOOKS

AIRPLANE ENGINE ENCYCLOPEDIA
BY GLENN D. ANGLE — $7.50

TEXT BOOK OF AERONAUTICAL ENGINEERING
BY LIEUT. A. KLEMIN — $5.00

AERONAUTICAL RULE BOOK
N.A.A. — $2.00

WHO'S WHO IN AM. AERONAUTICS
GARDNER PUBLISHING CO., INC. — $1.00

Sent post paid upon receipt of check or money order

THE GARDNER PUBLISHING CO., Inc.
225 Fourth Ave. **New York City**

DOPES

PIGMENTED DOPES
VARNISHES ENAMELS

TITANINE

MADE BY
TITANINE, Inc.
UNION, UNION COUNTY, N. J.
Contractors to U. S. Government

The Weekly Issue of AVIATION That You Miss

because you are not a regular subscriber, may contain the article, news story, picture or advertisement which you should have used with profit.

If you are a Service or a civilian flier AVIATION is an indispensable adjunct to your calling, because in each weekly issue it publishes more service and commercial flying news than appears in any monthly; and, more important, it is NEWS when it appears in AVIATION.

AVIATION

The Oldest American Aircraft Magazine — The Only American Aircraft Weekly

Heartstrings of the Plane

SAFETY and endurance depend to a large measure on the tie-rods. Hartshorn Streamline Tie-Rods leave nothing to be desired on these counts and in addition, by presenting much less surface to the wind, aid greater speed without sacrificing safety.

Used by the Round-the-World Flyers, the Pulitzer Trophy Winners, etc. Made according to U. S. Army and Navy specifications.

Write for Circular A-1, describing our Wires and Strap End Fittings.

Hartshorn
Established 1860
STREAMLINE TIE-RODS

STEWART HARTSHORN CO., 250 Fifth Ave., New York City

INDEX TO ADVERTISERS

A

Aircraft Service Directory..... 170 - 171

B

Boeing Airplane Co..... 175

C

Classified Advertising..... 171
Columbia Aircraft Corporation..... 171
Curtiss Aeroplane & Motor Co..... 150

E

Ericson Aircraft, Ltd..... 171
Ericson, F. G..... 171

H

Hamilton Aero Mfg. Co..... 170
Hartney, Harold Evans..... 171
Hartshorn Co., Stewart..... 173
Huff Daland Aero Corp..... 170

I

Ireland, G. S..... 170

J

Johnson Airplane & Supply Co..... 172
Johnson Motor Products Co..... 171

L

Lamblin, Etablissements..... 172
Loening Aeronautical Engineering Corp..... 172
Ludington Exhibition Co., Inc..... 170

M

Martin, Glenn L., Co., The..... 174

N

National Steel Products Co..... 151
New York University..... 170
Northrop, Marvin A..... 171

O

Overcashier Aviation Co..... 170

P

Paragon Engineers, Inc..... 170
Pioneer Instrument Co..... 170

S

Sellers, Matthew B..... 171
Smith, J. Warren..... 170
Southern Airways, Inc..... 170

T

Tips & Smith..... 170
Titanine, Inc..... 173

W

Wallace Aero Co..... 170
War Department..... 172
Warner, Edward P..... 170
Where to Fly..... 168
Wright Aeronautical Corp..... 152

Y

Yackey Aircraft Co..... 171

Z

Zimmermann, Paul G..... 170

MARTIN U.S.A.

Trade Mark

A Good Record

FOR fourteen years the Glenn L. Martin Company has been building planes which can be depended on under any and all circumstances.

Leading up to this performance, and never commented on in the day's news, is a curious chain of events.

Glenn L. Martin, as a boy, built his first plane without ever having seen a successful flying machine. He taught himself to fly before he had ever seen a plane in flight.

He has never made a flight in any plane except his own.

And he flew professionally as an exhibition flyer for three years without a serious injury. Is it any wonder that his men believe in their own planes?

THE GLENN L. MARTIN COMPANY
CLEVELAND, OHIO

Builders of Quality Aircraft since 1909

Take Advantage of This Offer

Five Dollars Worth for $4.00

We have left from an edition of 5,000 a few copies of **WHO'S WHO IN AMERICAN AERONAUTICS.** To clear our shelves and make way for the new edition of **WHO'S WHO** which is now in preparation, we will mail, postpaid as long as the supply lasts, a copy of this valuable reference book

Free with each new subscription to AVIATION

(at $4.00 in the U. S., Canada and Mexico $5.00, other foreign $6.00)

received before March 1, 1925.

While this offer lasts you may secure **AVIATION** for a year (52 issues) at the regular subscription rate and **WHO'S WHO IN AMERICAN AERONAUTICS,** (the regular price of which to everyone has been $1.00) for the cost of a subscription alone.

Who's Who contains nearly a thousand biographies of those prominent in American Aeronautics, hundreds of photographs, valuable statistical information, organization and directory of the Army Air Service, Bureau of Aeronautics, Navy Department, Air Mail Service and other important organizations.

AVIATION is the only American publication which gives each week a review of the important news of aeronautics throughout the world; photographs and descriptions of the latest machines and independent editorial expression on the problems and progress of flying in the United States.

You need AVIATION to keep in touch with big new developments this year, and you will find WHO'S WHO a valuable supplement to your reading.

This is an offer of genuine value but it is limited to only about 100 new subscribers.

So Send In The Coupon Now

GARDNER PUBLISHING CO.
225 FOURTH AVENUE, NEW YORK.

For the enclosed dollars ($4.00 in U. S., $5.00 in Mexico and Canada, other foreign, $6.00) send me postpaid a copy of Who's Who in American Aeronautics and the next 52 issues of AVIATION, in accordance with your special offer.

BOEING PURSUIT

Recognized by Military Services as the Finest Single Seater Fighter in the World

The ORIGINAL combination of:

An Underslung Sloping Core Radiator;

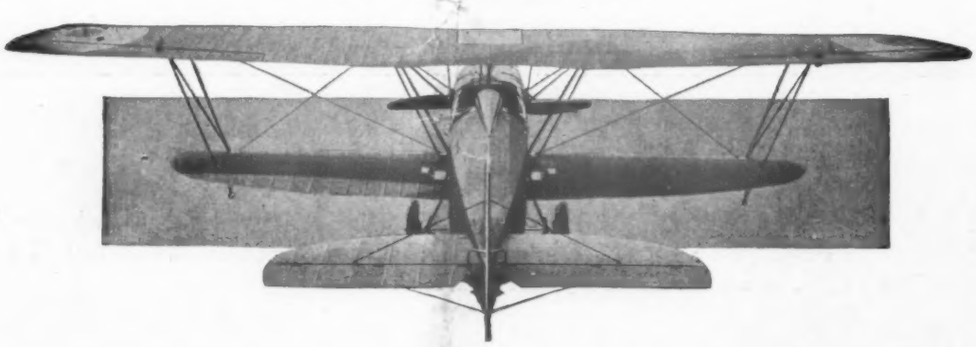
A Small Body properly arranged;

A Semi-thick Airfoil Section of True Contour throughout the entire length of both the Small Elliptical Lower Wing and the Larger Tapered Upper Wing;

A Single Bay Biplane with external brace wires in Front Truss Only;

An ideal proportioning of Unbalanced Control Surfaces, giving unprecedented ease and range of control.

DESIGNED IN THE YEAR 1922; PRODUCED AND FLOWN EARLY IN THE YEAR 1923

BOEING AIRPLANE COMPANY

SEATTLE, WASHINGTON